CAMCORDER
USER'S MANUAL

PROSCAN

So Advanced. Yet So Simple.

PRO898LH
PRO998LH

Important Safety Information

Be sure to read all the safety information before you begin to use this product.

WARNING: To reduce the risk of fire or shock hazard, do not expose camcorder or AC adapter/charger to rain or moisture.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

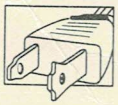
ATTENTION
RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR

This symbol indicates "dangerous voltage" inside the product that presents a risk of electric shock or personal injury.

This symbol indicates important instructions accompanying the product.

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE THE COVER (OR BACK). NO USER-SERVICEABLE PARTS ARE INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Cautions



CAUTION: To prevent electric shock, match wide blade of plug to wide slot, fully insert.

ATTENTION: Pour éviter les chocs électriques, introduire la lame la plus large de la fiche dans la borne correspondante de la prise et pousser jusqu au fond.

To reduce risk of injury, charge only rechargeable batteries recommended by the manufacturer for this camcorder. Other types of batteries may burst causing damage and personal injury.

FCC Regulations state that unauthorized changes or modifications to this equipment may void the user's authority to operate it.

Precautions

WARNING: Many television programs and films are copyrighted. In certain circumstances, copyright law may apply to private in-home videotaping of copyrighted materials.

This camcorder can use 8 and Hi8 video cassettes. It automatically determines the loaded cassette is 8 or Hi8 and records and plays it back correctly.

The LCD ViewScreen is manufactured using high-precision technology. However, there may be some tiny black points and/or bright points (red, blue, or green in color) that constantly appear on the screen. These points are normal in the manufacturing process and do not affect the recorded picture in any way.

Warning: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct by one or more of the following measures:

— Reorient or relocate the receiving antenna.
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.

Caution to the user: Changes or modifications not expressly approved by the manufacture could void the user's authority to operate the equipment.

Notes:

- This unit uses 8mm video format cassettes.
- It records and plays back in the SP mode (14.3 mm/sec).
- It cannot record and play back in the LP mode (7.2 mm/sec).
- This unit uses a Hi-Fi stereo sound system. When a tape recorded by this camcorder is played by a conventional 8mm camcorder, monaural sound is output. When a tape recorded by a conventional 8mm camcorder is played in this machine, monaural sound is output.

MOISTURE

Avoid operating your camcorder immediately after moving it from a cold place to a warm, humid place. Give the camcorder 2 to 3 hours to stabilize in the ambient conditions of the surroundings before inserting a cassette. When moved from a cold place to a warm, humid place, moisture may condense on the head drum inside the machine. This moisture could cause the tape to stick to the headwheel and damage the headwheel or tape.
When a small amount of moisture is sensed, "TAPE" flashes in the viewfinder or on the LCD ViewScreen. Remove the cassette and set the CAM/OFF/VIDEO switch to OFF, then wait for about one hour.

IMPORTANT SAFEGUARDS

In addition to the careful attention devoted to quality standards in the manufacture of your video product, safety is a major factor in the design of every instrument. But, safety is your responsibility too.

This page lists important information that will help to assure your enjoyment and proper use of a Video camcorder and accessory equipment. Please read it carefully before operating your video product and keep it in a handy place for future reference.

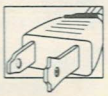
INSTALLATION

1 Read and Follow Instructions — All the safety and operating instructions should be read before the video product is operated. Follow-all operating and use instructions.

2 Retain Instructions — The safety and operating instructions should be retained for future reference.

3 Heed Warnings — Comply with all warnings on the video product and in the operating instructions.

4 Polarized Plug — This video product is equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. To prevent electric shock do not use this polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted without blade exposure. If you need an extension, use a polarized cord.

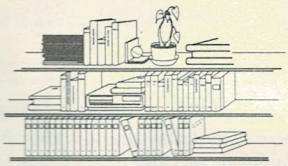


5 Power Sources — This video product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home. consult your video dealer or local power company. For video products intended to operate from battery power, or other sources, refer to the operating instructions.

6 Overloading — Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock. Overloaded AC outlets and extension cords are dangerous, and so are frayed power cords, damaged or cracked wire insulation and broken plugs. They may result in a shock or fire hazard. Periodically examine the cord and have it replaced by your service technician if appearance indicates damage or deteriorated insulation.

7 Power-Cord Protection — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

8 Ventilation — Slots and openings in the cabinet are provided for ventilation to ensure reliable operation of the video product and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the video product on a bed, sofa, rug, or other similar surface. This video product should never be placed near or over a radiator or heat register. This video product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the video product manufacturer's instructions have been followed.



9 Attachments — Do not use attachments unless recommended by the video product manufacturer as they may cause hazards.

Caution: Maintain electrical safety. Powerline operated equipment or accessories connected to this unit should bear the UL listing mark or CSA certification mark on the accessory itself and should not have been modified so as to defeat the safety features. This will help avoid any potential hazard from electric shock or fire. If in doubt, contact qualified service personnel.

10 Water and Moisture — Do not use this video product near water — for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.

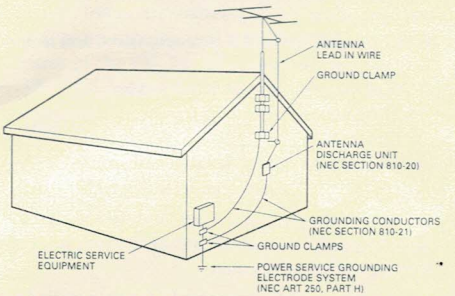
11 Accessories — Do not place this video product on an unstable cart, stand, tripod, bracket, or table. The video product may fall, causing serious injury to a child or adult, and serious damage to the appliance. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the video product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

11A An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

S3125A

12 Outdoor Antenna Grounding — If an outside antenna or cable system is connected to the video product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See example below.

EXAMPLE OF ANTENNA GROUNDING


ANTENNA LEAD IN WIRE
GROUND CLAMP
ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)
GROUNDING CONDUCTORS (NEC SECTION 810-21)
GROUND CLAMPS
ELECTRIC SERVICE EQUIPMENT
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ART 250, PART H)

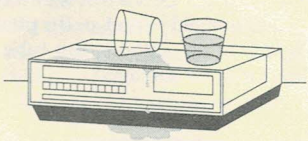
NEC — NATIONAL ELECTRICAL CODE

13 Power Lines — An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching or approaching such power lines or circuits as contact with them might be fatal. Installing an outdoor antenna can be hazardous and should be left to a professional antenna installer.

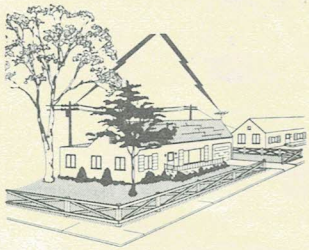
USE

14 Cleaning — Unplug this video product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

15 Object and Liquid Entry — Never push objects of any kind into this video product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the video product.



16 Lightning — For added protection for this video product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable-system. This will prevent damage to the video product due to lightning and power-line surges.



SERVICE

17 Servicing — Do not attempt to service this video product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

18 Conditions Requiring Service — Unplug this video product from the wall outlet and refer servicing to qualified service personnel under the following conditions.

a. When the power-supply cord or plug is damaged.
b. If liquid has been spilled, or objects have fallen into the video product.
c. If the video product has been exposed to rain or water.
d. If the video product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.
e. If the video product has been dropped or the cabinet has been damaged.
f. When the video product exhibits a distinct change in performance — this indicates a need for service.

19 Replacement Parts — When replacement parts are required, have the service technician verify that the replacements he uses have the same safety characteristics as the original parts. Use of replacements specified by the video product manufacturer can prevent fire, electric shock or other hazards.

20 Safety Check — Upon completion of any service or repairs to this video product, ask the service technician to perform safety checks recommended by the manufacturer to determine that the video product is in safe operating condition.

21 Heat — The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

IMPORTANT SAFETY INSTRUCTIONS FOR AC ADAPTER/CHARGER

1. Save these Instructions — This page contains important safety and operating instructions for AC Adapter/Charger provided with your camcorder.
2. Before using AC Adapter/Charger, read all instructions and cautionary markings on (1) AC Adapter/Charger, (2) battery and (3) product using battery.
3. Also read all instructions on pages 4 and 5.
4. Caution — To reduce risk of injury, charge only rechargeable battery, CC-HIT555.
   Other types of batteries may burst causing personal injury and damage.
5. Do not expose charger to rain or snow.
6. Use of an attachment nor recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons.
7. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
8. Make sure cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
9. Do not operate charger with damaged cord or plug — replace them immediately.
10. An extension cord should not be used unless absolutely necessary.
    Use of improper extension cord could result in a risk of fire and electric shock. If extension cord must be used, make sure:
    A. The pins on plug of extension cord are the same number, size, and shape as those of plug on charger.
    B. That extension cord is properly wired and in good electrical condition; and
    C. That wire size should be met below:

Minimum AWG size	Length of extension cord (feet)
18	Equal to or less than 100
16	Equal to or less than 150

11. Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.
12. Do not disassemble charger: take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
13. To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning.

Before You Begin

Any problems that occur as a result of any of the following conditions will not be covered by our warranty.

- Be careful that no water, dust or sand enters the camcorder and all accessories.
- When you shoot at a scene which contains an extremely bright object such as the sun or a light source, a bright vertical bar may appear in the picture.
  Your camcorder is functioning properly, but the solid-state pickup device (C.C.D) usually causes this as an inherent characteristic. Try to avoid shooting an excessive bright object directly.
- Be sure not to leave the camcorder in a place where the temperature exceeds 140°F (60°C), or the pickup device may be damaged.
  Dangerous includes:
  - Inside a car with the windows closed and in direct sunshine.
  - Near heating appliances.
- Do not leave the viewfinder lens and the liquid crystal display (LCD) ViewScreen facing sunlight for a prolonged period, or the phosphorescent surface of the cathode ray tube and the LCD panel may be damaged.

Read This First

To guide you, we've included:

- An "Important Information" section containing important cautions for your family's safety as well as instruction for getting your video camcorder ready to use. Please read this section thoroughly before continuing.
- A "Getting Started" section to familiarize yourself with the controls and prepare you for recording.
- A "Basic Techniques" section to help you to use your video camcorder quickly and confidently before advancing to the more sophisticated features of the PROSCAN.
- The "Advanced Techniques" section that explains the exciting, sophisticated features of your camcorder.
- A "General Maintenance" section to help keep your purchase in good repair.

We want this manual to be as helpful as possible, so it includes two easy ways to find the information you need:

- A quick index for the information you use most often (this page).
- A detailed table of contents directing you to specific information quickly (page 8).

Get to know your video camcorder by using this manual. We appreciate your business.

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Features

- Easy to use
- Color liquid crystal display (LCD) ViewScreen with speaker
- View screen
- Lithium Ion battery
- Auto DC light
- 72X zoom ratio
- X240 digital zoom (with instant zoom)
- Digital effects
- Electronic Image Stabilization (EIS)
- Fade in/fade out
- Instant zoom
- Recorded date search
- Automatic title recording
- Video effects
- Multi playback (PAL60 conversion)

Types of differences

	PRO898LH	PRO998LH
LCD ViewScreen size	3-inch	3.5-inch

- This instruction manual shows the illustrations for the PRO998LH.

With this camcorder you can view the picture being recorded or the playback picture whether on the LCD ViewScreen or in the viewfinder. Opening or closing the LCD ViewScreen switches the picture to appear on the LCD ViewScreen or in the viewfinder. The following text describes the operation assuming that the viewfinder is used as a major monitor device.

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Getting Started

This section guides you through the initial preparation of the camcorder. Set aside some time, relax, and familiarize yourself with this quality instrument.

Enjoy getting to know all about your PROSCAN 8mm camcorder. The more comfortable and familiar you are with the machine and its features, the more you can make it do for you. Let's get started!

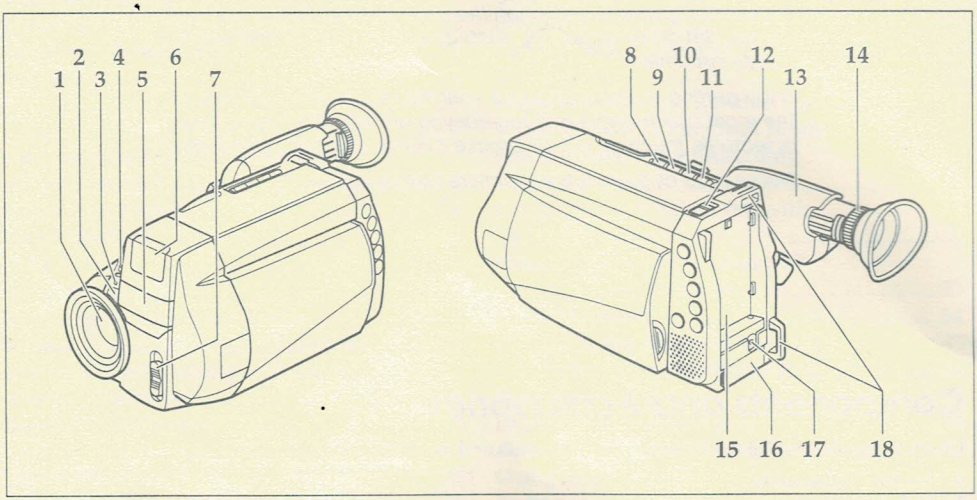
Please read all the safety instructions before you begin.

Components and Accessories

Check that you have all the following components and accessories before proceeding.

1. Audio/Video cable
2. Battery pack
3. AC adapter/charger
4. Battery for date/title
5. Shoulder strap
6. DC cord
7. Remote control
8. Batteries for remote control

Review Your Camcorder's Controls



1. Lens Door

The door will automatically open when the CAM/OFF/VIDEO switch is set to "CAM." Setting the switch to "OFF" will close the door.

2. Infrared Receiver

The area where infrared signals from the remote are received. Aim the remote control to this area for best results.

3. Record Indicator

This indicator flashes when the camcorder is recording.

4. Auto Light Switch

When this switch is set to AUTO, the light turns on or off automatically according to the brightness of the object. When the switch is set to ON, the light turns on. Set the switch to OFF to turn the light off manually. ("Using the Auto DC Light," p50)

5. Microphone

Sensitive to sounds coming from the direction in which the camera is pointed.

6. Auto Light

When the CAM/OFF/VIDEO switch is in the CAM position, the light is turned on and off automatically or manually in the record and record pause modes depending on the position of the Light switch. Turn the auto light off after use. ("Using the Auto DC Light," p50)

Note: The auto light turns on only in the record and record pause modes.

7. CAM/OFF/VIDEO Power Switch

This switch turns the camcorder on and off. Set the switch to CAM for camera recording, and to VIDEO for playback. Hold down the small red button as you slide the switch to CAM or VIDEO. You do not need to hold down the red button to slide the switch to OFF.

8. F.FWD Button

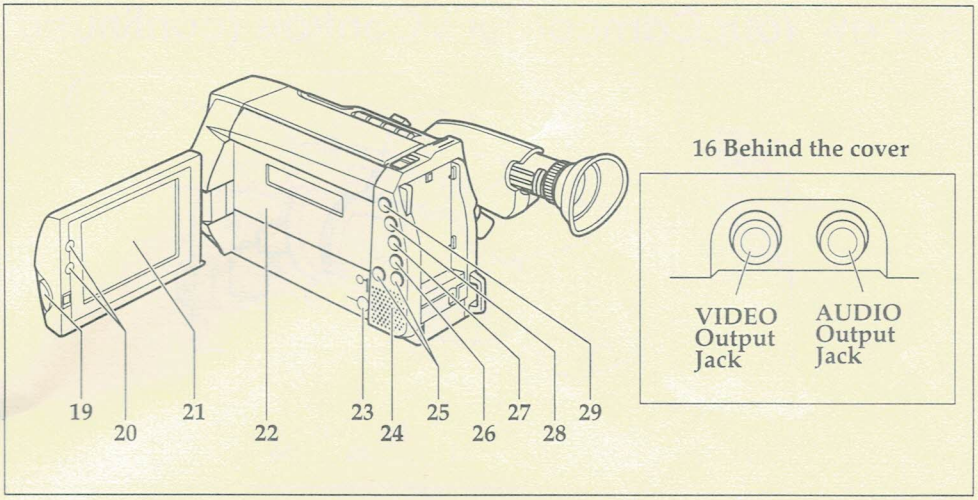
Use this button to fast forward tapes or to visually search. During visual search, the camcorder fast forwards at approximately 9 times normal playback speed. During fast forward, press and hold this button to visually scan the tape forward at 17 times the normal playback speed. ("Using Forward and Reverse Search," p30) Also use this button to set date and time and create a title ("Creating and Recording a Title," p45).

9. PLAY Button

Use to play back recorded tapes and create a title. ("Creating and Recording a Title," p45)

10. REW/REVIEW Button

Use this button to fast rewind tapes or to visually search. During visual search, the camcorder rewinds at approximately 7 times normal playback speed. During rewind, press and hold this button to visually scan the tape backwards at 15 times the normal playback speed. ("Using Forward and Reverse Search," p30) Also use this button to set date and time and create a title ("Creating and Recording a Title," p45). Furthermore, use this button to review the last few seconds of the tape you are recording.



11. STOP Button

Use this button to stop playback, fast forward, or reverse. Also use this button to set date and time and create a title. ("Creating and Recording a Title," p45).

12. BATTERY Release Lever

Releases the battery attached to camcorder.

13. Electronic Viewfinder

14. Diopter Control

To use the electronic viewfinder, pull the eye cup all the way, and then turn this control for your optimum focus adjustment. ("Eyepiece Adjustment," p21)

15. Power Supply Attachment Section

Attach the battery here ("Camcorder Batteries," p16).

16. AUDIO/VIDEO Output Jacks (Behind the jack cover)

Use these jacks to connect the camcorder to a VCR or television ("Playing Back Your Recording," p32, 33, "Dubbing from the camcorder to a VCR," p48).

- Connect the yellow plug of the audio/video cable to the yellow jack (VIDEO OUT) and the white plug to the white jack (AUDIO OUT).

17. DC IN Jack

When using the AC adapter/charger, connect one end of the DC cord (provided) to this jack and the other end to the DC OUT jack of the AC adapter/charger.

Note: The DC cord cannot be connected to camcorder if a battery pack is attached.

18. Shoulder Strap Slots

Attach the shoulder strap here.

19. OPEN Button

Push this button to open the LCD ViewScreen.

20. Bright Control Buttons

Use this to adjust the brightness of the LCD ViewScreen ("Adjusting the Brightness of the LCD ViewScreen," p19).

21. LCD ViewScreen

You can view the pictures as they are being recorded and play them back immediately after recording on the LCD ViewScreen. ("LCD ViewScreen," p19)

22. Cassette Holder

A power source must be connected to the camcorder before a cassette can be inserted or removed.

23. EJECT Button

Press this button to open the cassette holder. A power source must be connected before cassettes can be inserted or removed though the CAM/OFF/VIDEO switch may be set to OFF ("Inserting and Removing Cassettes," p18).

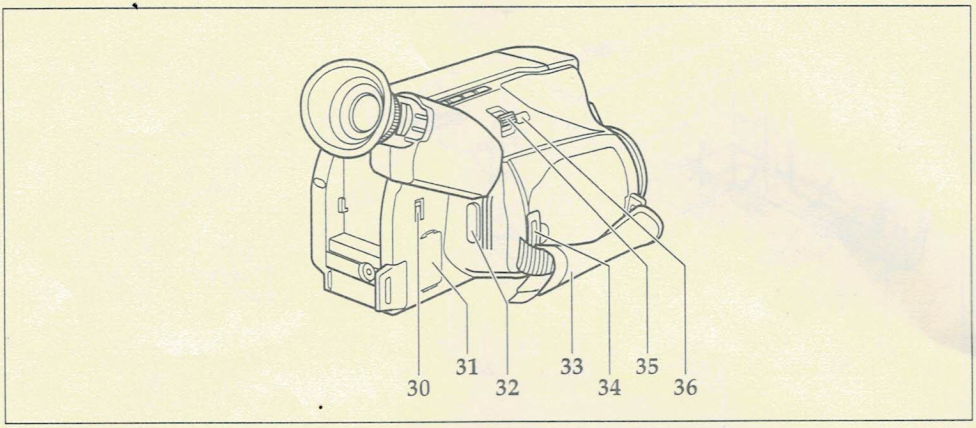
Note: The EJECT button is inoperable unless the LCD ViewScreen is completely open.

24. Speaker

You can listen to the recorded sound.

Note: No sound is heard when the LCD ViewScreen is closed.

Review Your Camcorder's Controls (continued)



25. FOCUS/VOL. (volume) Control Buttons

When the CAM/OFF/VIDEO switch is set to CAM, these buttons will be the focus control buttons. Press them simultaneously to select manual or automatic focusing. To control focus manually ("Using Manual Focus," p27), press the ▲ or ▼ button to bring the subject into focus. When manual focus has been engaged, "FOCUS" will appear in the viewfinder or on the LCD ViewScreen.

When your are viewing playback pictures on the LCD ViewScreen with the CAM/OFF/VIDEO switch set to VIDEO, these buttons can be used to control the volume of the built-in speaker. ("Playback," p29)

26. DATE/DISP. Button

When the CAM/OFF/VIDEO switch is set to CAM, this button can be used as the DATE button: set the date and time, and select the date display you want to record ("Setting the Date and Time," p23 and "Date Recording," p37).

In the VIDEO mode, the DATE/DISP. button is used as the DISPLAY button ("Using the Display Button," p42).

Note: Be sure to insert the clock battery before setting the date and time or creating a title.

27. D.EFFECT Button

Use this button to digitally process the image you are going to record or the playback image. During recording, you can select one of six effects: 16x9, negative/positive, X240 digital zoom, half-mirror, mosaic, or art ("Digital Effects Recording," p38).

During playback, you can select one of three effects: 16x9, art, or sepia ("Video Effects in Playback Mode," p31).

28. FADE Button

There are four types of fades; wipe fade, mosaic fade, art fade, and black-and-white fade ("Using Fade," p40).

29. EIS (Electronic Image Stabilizer) Button

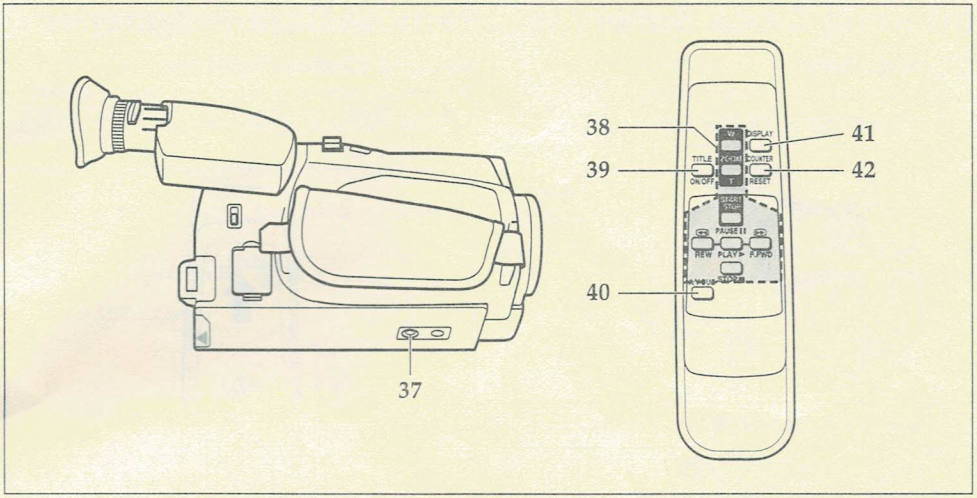
EIS corrects slight shaking of an image ("Using the Electronic Image Stabilizer," p41).

30. PAL60 Switch (Multi Playback)

Set this switch to OFF for ordinary camcorder use. Set to PAL60 only when connecting the camcorder to a PAL TV which handles PAL60 mode signal and has vertical sync adjustment circuitry for 60Hz.

Notes:

- Make sure the switch is in the OFF position when connecting the camcorder to an NTSC TV for playback, or monitoring the playback picture on the camcorder's LCD ViewScreen. If the switch is set to PAL60 in the above cases, no color will appear in the picture.
- The PAL60 switch is effective during playback only.
- See TV instruction manual for details about setting of PAL60 mode.
- Depending on the state of the tape recorded, the PAL60 switch may not operate normally.
- Tape recorded on PAL system cannot be played back.



31. Audio/Video Output Jack (Behind the jack cover)

Use this jack to connect the camcorder to a VCR or television ("Playing Back Your Recording," p32, 33, "Dubbing from the camcorder to a VCR," p48).

32. Start/Stop Button

When the CAM/OFF/VIDEO switch is in CAM press this button to start recording. When pressed a second time the camera pauses.

During playback use this button to stop the tape temporarily. Press it a second time to resume normal playback.

33. Hand Strap

Refer to page 21.

34. Clock Battery Compartment

Pull the battery holder and install the clock battery (provided). ("Inserting Clock Battery and Remote Control Batteries," p14.)

35. Power Zoom Control

Use this to zoom in and out on a subject ("Using the Power Zoom," p27).

36. INST. ZOOM (Instant Zoom) Button

Use this button to magnify the image being recorded 1.5 times.

37. Tripod Mounting Threaded Socket

Use this threaded socket to mount the camcorder to a tripod.

38. Remote Control

The shaded buttons on the remote control have the same functions as the corresponding buttons on the camcorder.

39. TITLE ON/OFF Button (only on the remote control)

Use this button to create and record titles for your tapes ("Creating and Recording a Title," p45).

40. A/V DUB Button (only on the remote control)

Use this button to record new audio and video over existing audio and video.

41. DISPLAY Button

Use this button to select the viewfinder or LCD ViewScreen and TV display ("Using the Display Button," p42). This button can be used instead of the DATE/DISP. button on the camcorder in the VIDEO mode.

42. COUNTER RESET Button (only on the remote control)

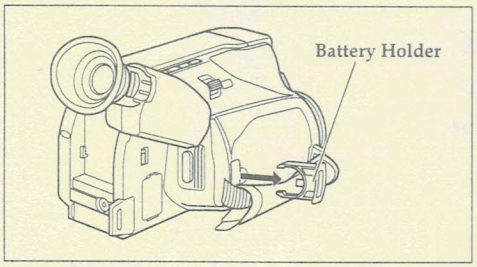
Use this button to reset the linear time counter to "0:00:00."

Inserting Clock Battery and Remote Control Batteries

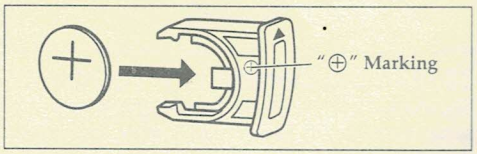
Clock Battery

Install the battery to prevent misplacing it.

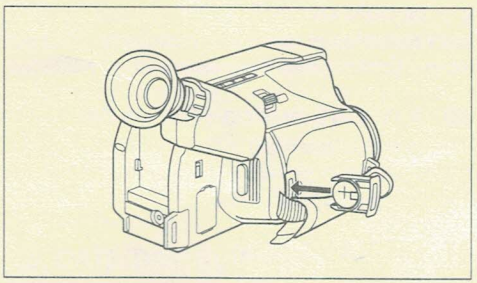
1. Pull out the battery holder using such as coins.



2. Insert the battery with the "+" side facing up.



3. Fully insert the battery holder into the camcorder.



WARNING: KEEP THE BATTERY AWAY FROM CHILDREN AND PETS.

IF SWALLOWED CONSULT A PHYSICIAN IMMEDIATELY FOR EMERGENCY TREATMENT.

Note: Replace battery with a 3V micro lithium cell.

Note: Dispose of battery safely in accordance with local laws. Do not dispose of in fire.

Note: Do not short circuit the battery.

Note: Do not take apart the battery.

Note: Do not hold the battery with the metallic tweezers.

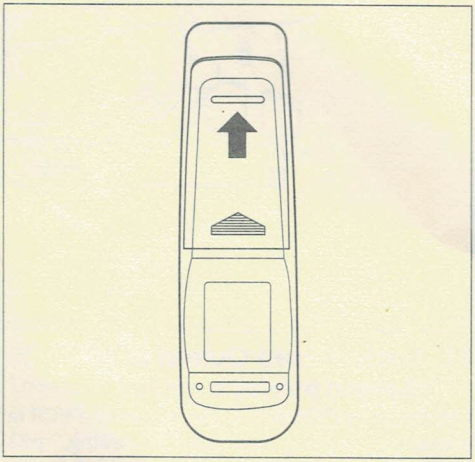
Note: Do not recharge the battery.

Note: Keep the battery in a dark, cool, dry place.

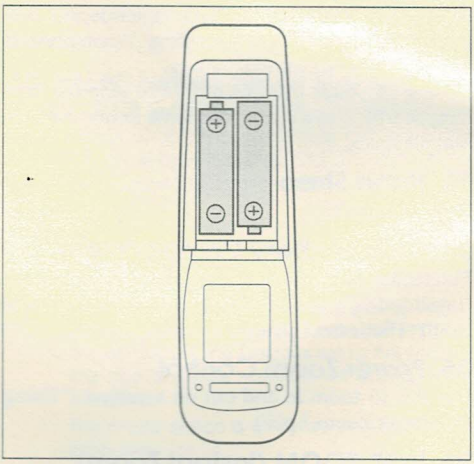
Remote Control Batteries

The remote control requires two "AA" batteries.

1. Slide the cover in the direction of the arrow to remove it.



2. Install batteries.
   Be careful to install with correct polarity.



3. Re-attach the cover to the remote control.

Cautions on the batteries:

- Do not use the old and new batteries at the same time.
- Do not mix batteries of different types.
- Do not short, take apart or dispose of batteries by throwing them into a fire.
- When liquid leaks, wipe it off completely and then insert new batteries.

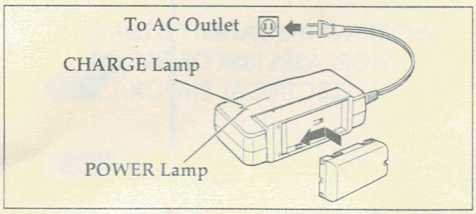
Charging the Battery

The first step is to set the battery to charge. To charge the battery, use the AC adapter/charger (provided).

Charge the battery at a temperature range of 50°F (10°C) — 86°F (30°C) to prevent damage to the battery.

Note: This camcorder operates with the Lithium ion battery such as CC-HIT555.

Charge the battery on a flat surface without vibration.



1. Plug the AC adapter/charger power cord into an AC outlet. The POWER lamp (red) lights up.
2. Align the bottom of the battery with mark ▶ on the AC adapter/charger, and then slide it in the direction of the arrow as shown in the figure. The CHARGE lamp (green) will light.
3. The CHARGE lamp will repeatedly light for 3 seconds and then go off to show that the battery has been charged to approximately 70% of its capacity. When the CHARGE lamp goes out, the battery is completely charged. After the lamp goes out, unplug the AC adapter/charger from the AC outlet and remove the battery from the AC adapter/charger.

Note: You can use the battery before it is completely charged.

Note: Remove the DC cord from the AC adapter/charger before attempting to charge the battery.

Note: If you re-attach the fully charged battery to the AC adapter/charger after the CHARGE lamp goes out, the lamp will light. This simply informs you that the battery has been completely charged; it does not indicate that the charge has been insufficient.

Note: Charging at low temperatures will decrease charge capacity.

Charging Time

Charging \ Battery pack	CC-HIT555
Full charge	2 hrs. 10 min.
70% charge	1 hr. 10 min.

Operating Time

The camcorder operating time depends on how often you turn power on/off and use start/stop and zoom.

- **Continuous Recording**

	Battery pack: LCD	CC-HIT555
PRO898LH	OFF	2 hrs. 30 min.
	ON	2 hrs.
PRO998LH	OFF	2 hrs. 30 min.
	ON	1 hr. 50 min.

- **Typical Recording**

	Battery pack: LCD	CC-HIT555
PRO898LH	OFF	1 hr. 20 min.
	ON	1 hr.
PRO998LH	OFF	1 hr. 20 min.
	ON	1 hr.

Notes on the Battery

- It is recommended that the battery always be left in the discharged state when not in use, and charged before you use it.
- Avoid storing a fully charged battery, and do not store it in a place where the temperature is high: this will damage the battery.
- Do not operate the battery at temperature below 14°F (–10°C) or above 113°F (45°C). At extremely low temperatures operation time decreases, while at high temperature the battery may be damaged.
- If the POWER lamp begins to flash during charging, remove the battery and then reattach it to the AC adapter/charger. If the POWER lamp continues to flash after several attempts to attach it, the battery is unable to take a charge and must be replaced.
- Do not attach a hot battery to the AC adapter/charger. Allow it to cool.

THERE ARE NO USER-SERVICEABLE PARTS INSIDE THE BATTERY OR AC ADAPTER/CHARGER.

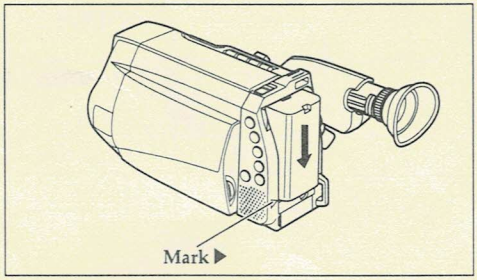
THROWING THE BATTERY INTO FIRE OR EXPOSING IT TO EXCESSIVE HEAT (ABOVE 140°F [60°C]) MAY CAUSE INJURY.

SHORTING THE BATTERY'S TERMINAL INCREASES RISK OF FIRE OR ELECTRICAL SHOCK.

Camcorder Batteries

Using Battery Pack

Before you install the battery for the first time it must be charged. See "Charging the Battery" on page 15 for details.



1. Align the bottom of the battery with mark ▶ on the camcorder so that the battery fits into the grooves.
2. Slide the battery downward, as illustrated.

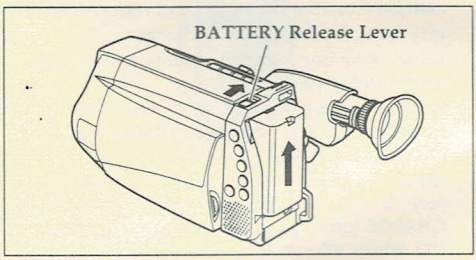
Note: Always remove the battery from the camcorder after use.

Note: We cannot guarantee against malfunctions of the camcorder which occur when you use battery packs other than those specified.

Note: Always attach a battery by the procedure described here. Attaching a battery forcibly could damage it.

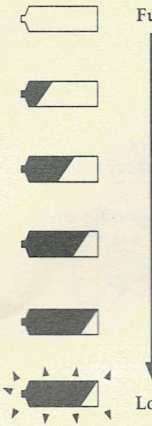
Removing the Battery Pack

Slide the BATTERY release lever in the direction of the arrow and hold it, then slide the battery to the upper side and remove.

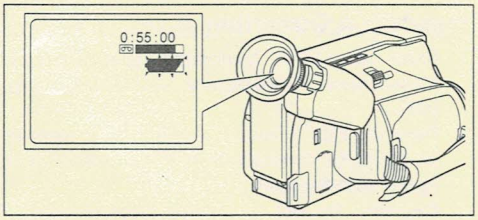


Checking the Battery's Charge

A battery charge indicator is located on the upper right corner of the viewfinder or LCD ViewScreen. One of six symbols is displayed when the battery is used.



This flashing symbol indicates that the battery is almost out of power. Use an alternative power source or charge the battery before continuing to use the camcorder.

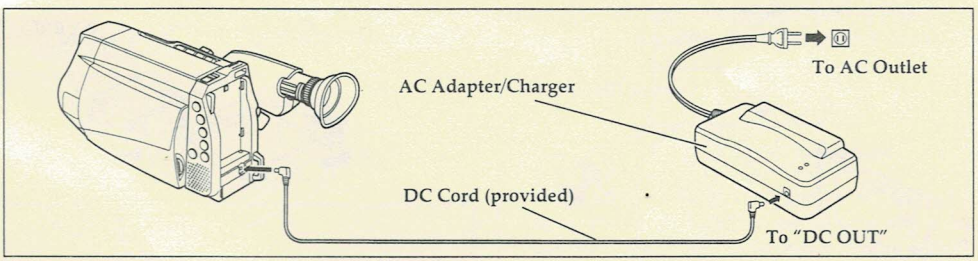


Note: The battery charge indicator does not appear when the camcorder is powered by the AC adapter/charger.

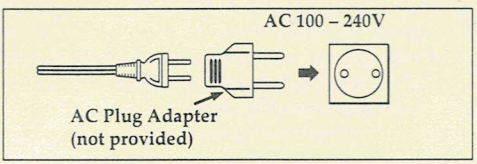
Using Alternative Power Source

Using the AC Adapter/Charger

Please ensure that the CAM/OFF/VIDEO switch is in the OFF position whenever attaching or detaching any power supply (ie. battery, AC adapter/charger, etc.).



1. Plug the AC adapter/charger power cord into an AC outlet. Make sure that the wide blade fits into the wide slot. If it doesn't fit try reversing it. If the blades still don't fit into the outlet, contact an electrician to replace your obsolete outlet, or use a polarized cord or outlet accessory.
2. Connect one end of the DC cord (provided) to the DC IN jack of the camcorder. Connect the other end of the DC cord to the DC OUT of the AC adapter/charger.



Using a Plug Adapter

A plug adapter (not provided) may be required in some countries.

1. Plug the adapter/charger's plug into the AC plug adapter
2. Plug the AC plug adapter into the AC outlet.

Inserting and Removing Cassettes

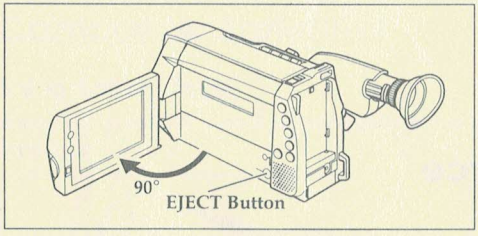
A power source must be connected before inserting or removing cassettes. Once connected, cassettes can be inserted or removed whether the CAM/OFF/VIDEO switch is on or off.

Inserting a Cassette

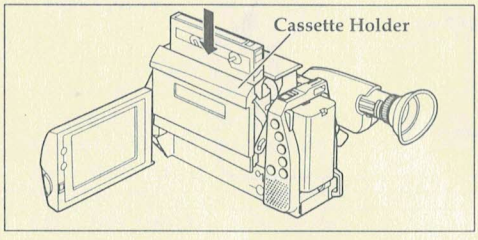
1. Press the OPEN button to open the LCD ViewScreen ("Opening the LCD ViewScreen," p19).
2. Press the EJECT button. " EJECT" appears on the LCD ViewScreen, and the cassette door opens automatically.

   Caution: Do not touch the cassette door when a cassette is being loaded or unloaded. If your finger is caught by the metal section of holder, it could be cut.

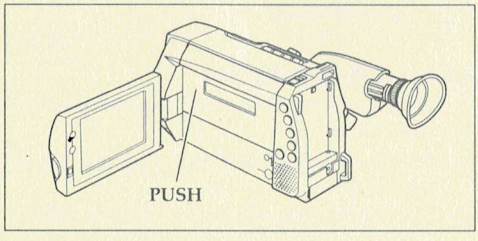
   Note: Cassette cannot be inserted or ejected unless the LCD ViewScreen is open: Open the monitor until it is at right angles to the camcorder.



3. Place the cassette in the cassette holder so that the transparent window faces away from the body of the camcorder and the sprockets toward the body of the camcorder.



4. Push the cassette door, which is embossed PUSH, until it "clicks" into place. The camcorder automatically closes.



Note: If "TAPE" flashes in the viewfinder or on the LCD ViewScreen, remove the cassette and check that the tape is not damaged, is not slack or no dust adheres to it, etc. After making sure that there is no abnormality, reinsert the cassette. If "TAPE" reappears, see "Troubleshooting" on page 53.

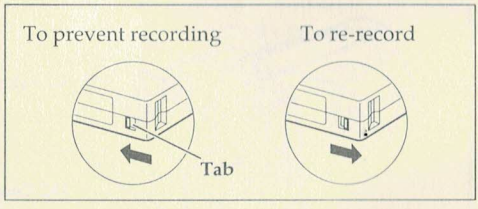
Note: If the tape is near the winding end, it may take longer to load it.

Removing a Cassette

Press the EJECT button. " EJECT" appears on the LCD ViewScreen, and the cassette door opens automatically. Remove the cassette.

Protecting Recorded Material

Protect 8mm cassettes from accidental erasure by sliding the tab on the side of the cassette toward the opposite side until the tab is completely visible. Slide the tab in the opposite direction, until the tab disappears, to record on the cassette again.



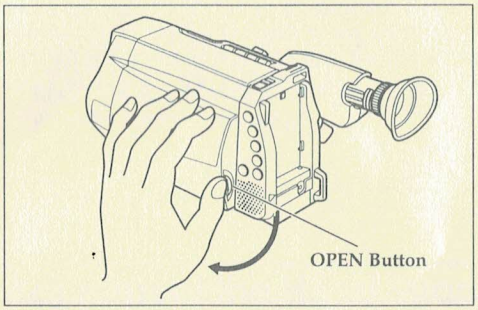
LCD ViewScreen

When using the LCD ViewScreen during recording and playback, you can adjust the brightness of its screen and the angle of the monitor.

Opening the LCD ViewScreen

1. Press the OPEN button to open the LCD ViewScreen.

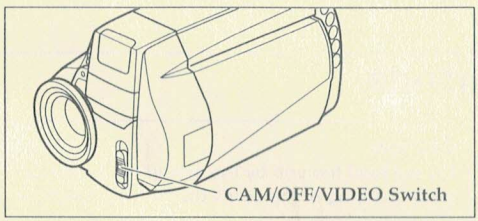
   Note: Opening or closing the LCD ViewScreen switches the picture to appear on the LCD ViewScreen or in the viewfinder.



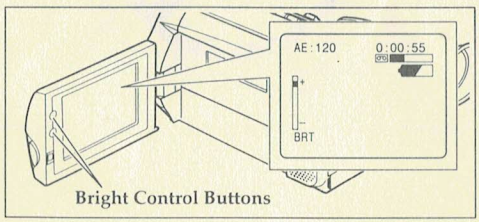
Adjusting the Brightness of the LCD ViewScreen

Note: Even when the picture on the LCD ViewScreen is adjusted, the recorded video will not change.

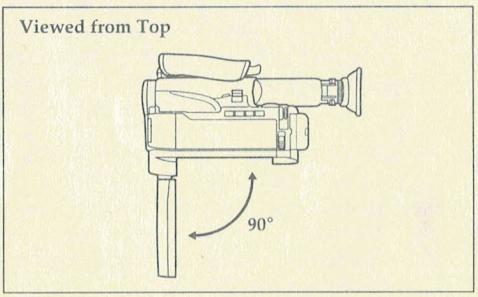
1. Load the battery ("Loading Batteries: Camcorder Batteries," p16). Press the red button on the CAM/OFF/VIDEO switch as you slide it to CAM or VIDEO.

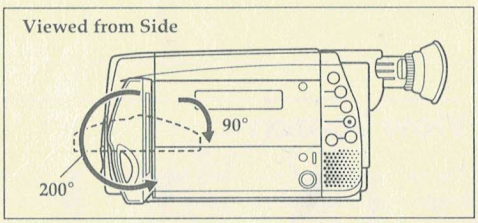


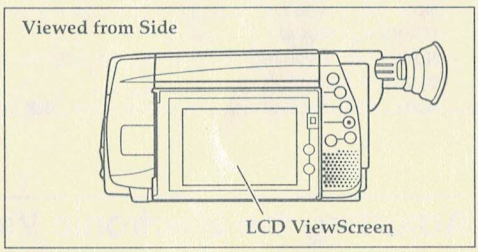
2. Use the brightness control buttons to adjust the brightness of the LCD ViewScreen. When you press either button, the brightness control display appears on the LCD ViewScreen for about 5 seconds. Press ▲ to increase brightness, or ▼ to decrease it. After 5 seconds, the adjustment display automatically disappears.



Range in which the LCD ViewScreen can be moved







- If the LCD ViewScreen is turned 90° so that it faces the same direction as the lens when the camera signal is being recorded during recording, recording pause, instant review, editing, A/V dubbing or A/V dubbing pause, the image on the monitor screen will become a mirror image, and the viewfinder will turn on. The on-screen display on the LCD ViewScreen will also be as if reflected on a mirror.
- If the LCD ViewScreen is closed with the screen facing to the side, the mirror image will change to a normal image when the LCD ViewScreen has been closed about 45°; also, the viewfinder will turn off.

Cautions on LCD ViewScreen

- Do not touch the LCD ViewScreen with your fingers as the screen could get dirty and the picture will not be seen clearly. If the LCD ViewScreen becomes dirty, use a soft cloth to wipe off the dirt.
- If the camcorder is used in a cold place and becomes too cold, the LCD ViewScreen will be dim for a while after the power is turned on. When the temperature inside the camcorder rises, the brightness of the picture will become normal.
- Do not hold by the LCD ViewScreen as this could cause a malfunction.
- Open the LCD ViewScreen by 90° before changing its direction. If you were to attempt to invert its direction before opening it completely, it could cause a malfunction.
- The LCD ViewScreen cannot be closed if it is tilted.
- Close the LCD ViewScreen after making sure it is parallel with the camcorder. If you were to close the ViewScreen while it faces the same direction as the lens or it is diagonal, it could damage the LCD ViewScreen.
- Do not disassemble the LCD ViewScreen as this might cause a malfunction.
- When opening the LCD ViewScreen, be careful that no water droplets adhere to the monitor screen and that no water or dust enters the camcorder through the gap as it could cause a malfunction.

View Screen

The camcorder automatically brightens the backlight of the LCD ViewScreen when you are recording a bright subject outdoors, so that the LCD ViewScreen is easy to see.

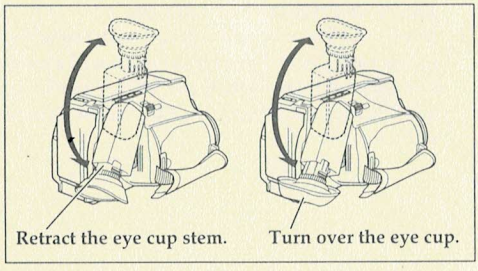
Note: When you record a bright subject outdoors, the camcorder operating time will be less than when recording indoors.

Note: Even if you record outdoors, the LCD ViewScreen backlight may not brighten, if you are aiming at a dark subject.

Note: While the battery charge indicator " ▬ " is flashing, the View Screen function will not operate.

Adjusting the Electronic Viewfinder

The electronic viewfinder adjusts simply by pivoting it to a position where it is comfortable and easy to see through. Place the viewfinder back in its original position before storing the camcorder in its case or carrying the camera recorder around to avoid damaging the viewfinder or camcorder.
To replace the viewfinder, retract the eye cup stem or turn over the eye cup.



Retract the eye cup stem. Turn over the eye cup.

CAUTION:
Do not hold the unit by the electronic viewfinder when carrying as this could cause a malfunction.

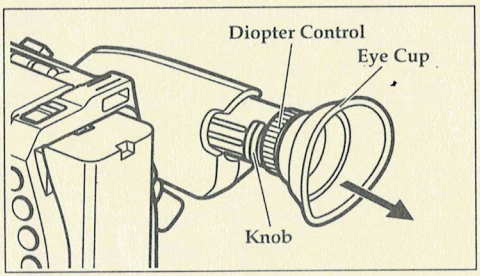
Eyepiece Adjustment

To use the electronic viewfinder, grasp the knobs on both sides of the eye cup stem and pull the eye cup all the way, then turn the diopter control for your optimum focus adjustment.
Since the eye cup has already been pulled out at the factory, in present condition, only adjustment of the diopter control is necessary.

Note: Be sure to pull out the eye cup all the way so that you can see the subject in the viewfinder clearly.

Note: Hold the knobs on both sides of the eye cup stem to pull out the eye cup.

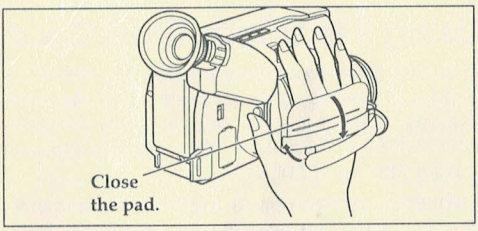
Note: The eye cup stem can be retracted when the camcorder is being carried.



Adjustment the Hand Strap

Adjust the hand strap to best fit your hand.

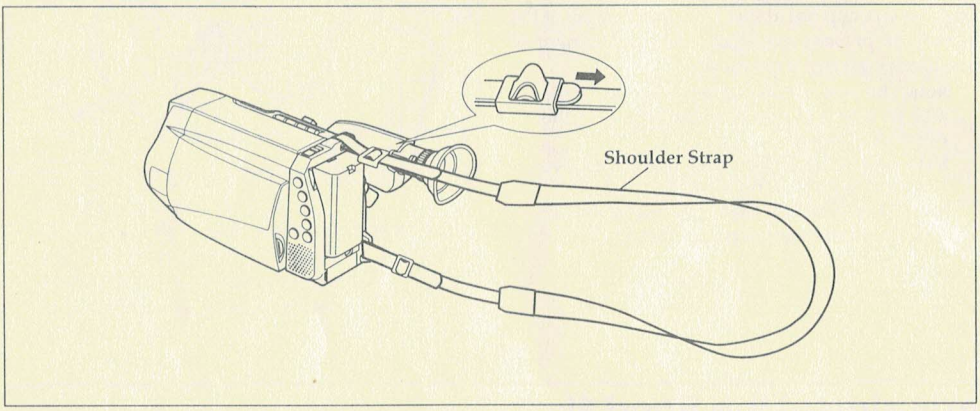
Note: After adjustment, close the hand strap's pad securely.



Attaching the Shoulder Strap

Thread the ends of the provided shoulder strap through the slots at the back of the camcorder and thread through the shoulder straps' buckles.

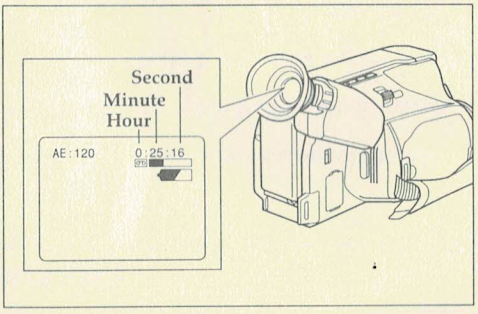
Note: Make sure that the straps are securely fastened before using the shoulder strap to carry the camcorder.



Using the Linear Time Counter

The linear time counter displays the tape run time in hours, minutes, and seconds. Use the time counter to keep track of how long you've been filming or how much time you have left to record before running out of tape.

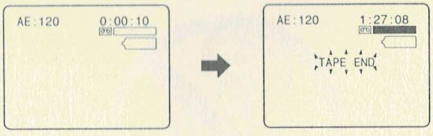
Turn the camcorder on to display the linear time counter. The linear time counter keeps track from the time you load a cassette into the camcorder and clears to "0:00:00" when the cassette is ejected.



Remaining Tape

The tape remaining display shows you how much tape is left on the cassette to record or play back.

Insert a cassette into the camcorder and start recording or playback; 10 seconds later, the remaining tape is displayed. When the cassette is ejected, the display will disappear. "⊡ – – – – – –" is displayed for 10 seconds after the tape starts to run.



Note: The tape remaining display appears 10 seconds after the tape starts to run.

Note: When the remaining tape time becomes less than about three minutes, "TAPE END" flashes in the viewfinder or on the LCD ViewScreen.

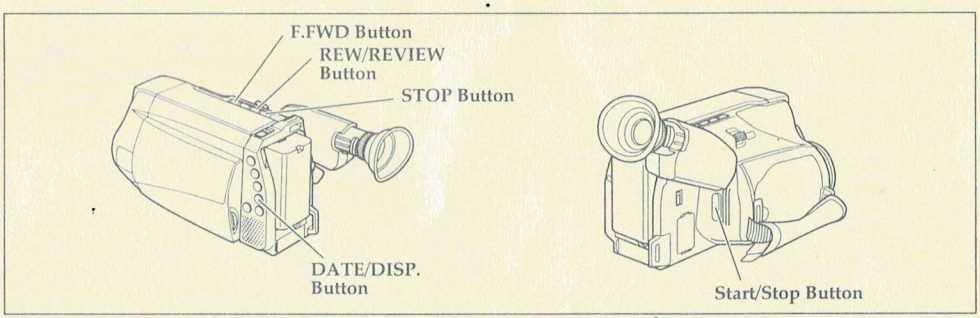
Setting the Date and Time

Take the time to set the date and time now. The date and time can be recorded on your tapes to act as a handy reference when you watch them later. Use the following procedure to set up the display for the current date and time.

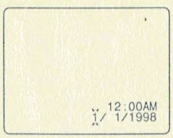
Note: Be sure to insert the clock battery before setting the date and time. Although the date and time can be set without the clock battery inserted, they will disappear when the battery providing power to the camcorder is removed.

Note: If you leave the powered camcorder for 10 minutes without a cassette inserted when the date has not been set or the clock battery is dead, the camcorder demonstration mode will start. To cancel the demo mode, disconnect power from camcorder and reconnect it, or insert a cassette.

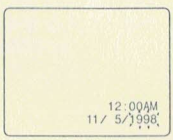
Make sure that the current time is displayed correctly before you start recording.



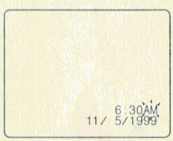
1. Load the battery ("Loading the Batteries: Camcorder batteries" p16). Press the red button on the CAM/OFF/VIDEO switch as you slide it to CAM.
2. Press the DATE/DISP. button and look into the viewfinder or LCD View-Screen. The date and time should appear in the lower right with the "1" flashing.



3. Pressing the F.FWD button gives you higher numbers while the REW/REVIEW button gives you lower numbers. Select the right month and press STOP button. Use the F.FWD, REW/REVIEW and STOP buttons to select the proper day, year, hour, minute, and AM or PM.



4. After setting the AM/PM, press the DATE/DISP. button. The display changes and the internal clock starts.



Note: After the date and time are set, "◷ AUTO" appears and the camcorder enters the automatic date recording mode. See "Date Recording" on page 37.

Correcting the Date and Time

1. Press the DATE/DISP. button while pressing the STOP button. The flashing cursor appears at the month.
2. Press the STOP button to move to the number you need to correct. Use the F.FWD and REW/REVIEW buttons to change the number.
3. Press the DATE/DISP. button to set the corrected date and time.

Basic Techniques

The batteries are in place and charged, the date and time are set, and you are familiar with the controls. It's time to make a recording.

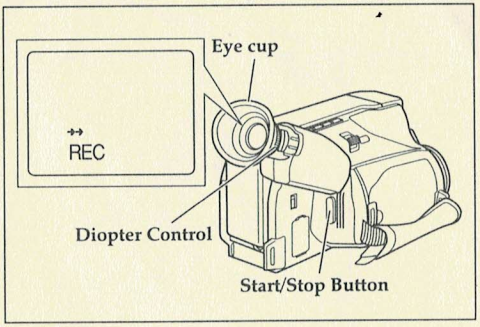
This section guides you through basic recording and playback. Practice the basic techniques of recording and playback on something unimportant such as traffic or a short tour of your backyard. Once familiar with how the machine works, you can move to the more sophisticated features with less stress.

Let's get started!

Making a Basic Recording

Your camcorder uses PROGRAM AE auto exposure that automatically selects the optimum shutter speed (either 1/60, 1/120, 1/180, 1/250, 1/350, 1/500, 1/750, 1/1000, 1/1500, 1/2000, or 1/4000 of a second). The iris adjusts automatically in response to the shutter speed.

1. Connect the camcorder to a power source ("Loading Batteries; Camcorder Batteries," p16 - p17).
2. Open the LCD ViewScreen and insert a cassette ("Inserting and Removing Cassettes," p18).
   If you want to view the picture being recorded on the LCD ViewScreen, leave the monitor open. If you want to view the picture in the viewfinder, close the LCD ViewScreen.
   Note: Pull out the eye cup all the way when using the viewfinder.
3. Press the red button on the CAM/OFF/VIDEO switch as you slide it to CAM. The lens door opens automatically. "●II" appears in the viewfinder or on the LCD ViewScreen and the camcorder is now ready to record.
4. When you are ready to record, press the Start/Stop button. "REC" appears and the camcorder records the picture you see in the viewfinder or on the LCD ViewScreen.
5. To stop recording press the Start/Stop button and "REC" disappears from the viewfinder or LCD ViewScreen replaced by "●II." The camcorder is in record/pause mode.
6. After recording, slide the CAM/OFF/VIDEO switch to OFF position to turn off the camcorder.
   Note: If the LCD ViewScreen is opened or closed (the monitor picture is switched between the viewfinder and LCD ViewScreen) during recording, the on-screen display disappears for about one second. Don't switch the picture during recording, as the date or title superimposed in the picture being recorded will disappear for about one second.



Note: If the LCD ViewScreen is opened or closed during recording, several white stripes may appear in the picture, but this does not indicate a fault. However, these stripes are recorded with the picture, so it is recommended that you do not close or open the LCD ViewScreen during recording.

Note: "TAPE" flashes in the viewfinder or on the LCD ViewScreen when the tab on the side of the cassette is completely visible.

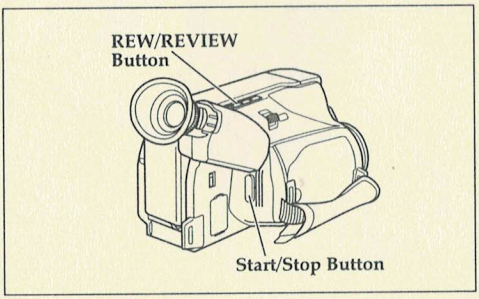
Note: "TAPE END" flashes in the viewfinder or on the LCD ViewScreen when about 3 minutes or less remain of the tape cassette.

Note: If the camcorder is left in record/ pause mode for more than 5 minutes, the camcorder turns off automatically. To restart it press the Start/Stop button and the camera returns to record/pause mode.

Using Instant Review

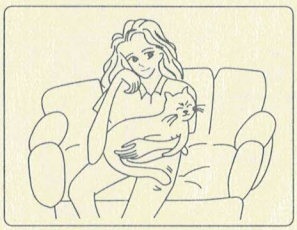
Use this feature to view the last few seconds of the tape you shot.

1. Set the camcorder to record/pause mode and press the REW/REVIEW button. The last few seconds of the tape play back in reverse and then in normal playback mode.
   Note: Sound is heard from the speaker during normal playback.
2. The camera plays back to the spot where you paused and returns to record/pause mode. Press the Start/Stop button to resume recording.

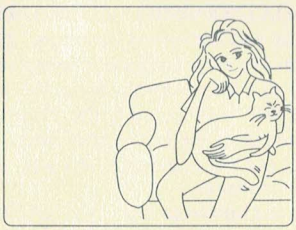


Using Auto Focus

The camcorder focuses the subject in the center of the viewfinder or LCD ViewScreen automatically unless you turn on the manual focus. If "FOCUS" appears in the viewfinder or on the LCD ViewScreen, manual focus is turned on. Press the FOCUS/VOL. control buttons simultaneously to return to auto focus.

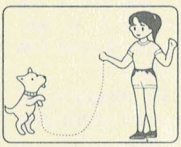


Good

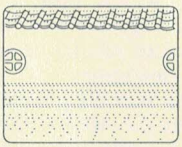


Not good

The auto focus will not work under the following conditions and you must focus manually:



Objects outside the center of the viewfinder or LCD ViewScreen



Objects with little difference in light reflection such as a white wall

Objects at different distances in the center of the view finder or LCD ViewScreen

Rapidly moving objects

Brightly lit objects such as a neon light, objects lit by spot-light, etc.

Dark objects

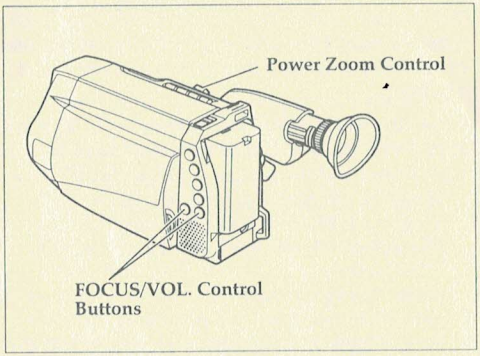
Objects behind water dappled or dusty glass

Note: With the T zoom control you can use the auto focus with subjects that are 3.3 feet (100 cm) away from the lens and further away to infinity. With the W zoom control you can use the auto focus with subjects 3/8 inches (1 cm) away from the lens and further away to infinity.

Using Manual Focus

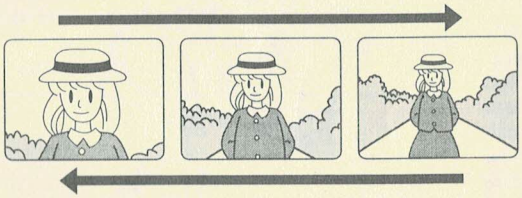
1. Press the FOCUS/VOL. control buttons simultaneously. "FOCUS" appears in the viewfinder or on the LCD ViewScreen. You can adjust the focus manually.
2. Use the power zoom T control to zoom up completely to your subject. If you don't use the T control to zoom to the picture you want, the picture may fall out of focus when actual recording starts.
3. Press the Focus control ▲ (far) or ▼ (near) button until the subject is in focus.
4. Use the power zoom W control to zoom back to the picture you desire.

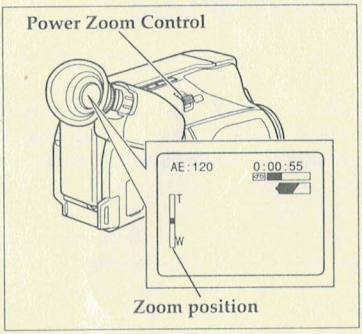
Note: To return to auto focus, press the FOCUS/VOL. control buttons and "FOCUS" disappears from the viewfinder or LCD ViewScreen.



Using the Power Zoom

The power zoom W (wide angle) control widens the picture, moving the subject farther away, while the power zoom T (telephoto) control brings the subject closer, narrowing the picture. If "ZOOM" appears at the left of the viewfinder or LCD ViewScreen, the digital zoom function shown below has been engaged.





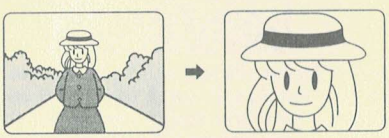
When the power zoom control is operated, the zoom position appears in the viewfinder or on the LCD ViewScreen for about 5 seconds and then disappears. The zoom position is displayed in 10 steps.

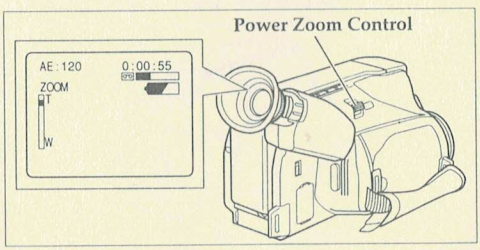
Using the Digital Zoom

The digital zoom increases the magnification of the power zoom by 4.5 times. You must place the subject you wish to magnify at the center of the viewfinder or LCD ViewScreen.

Slide and hold the power zoom control to the "T" side until you find the picture you want. You control the zoom with the power zoom T and W controls. When "ZOOM" is not displayed in the viewfinder or on the LCD ViewScreen, normal zoom functions resume.

Note: This digital zoom has certain limitations and may degrade the picture at extreme magnification and amplify camcorder's movement.





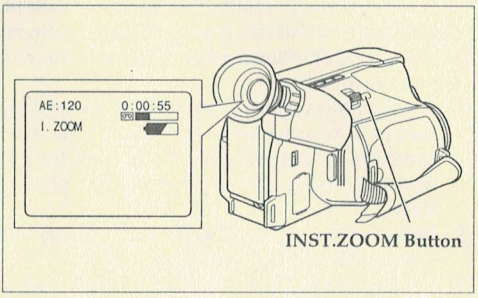
Using the INST. ZOOM (Instant Zoom) Button

The instant zoom feature activates the digital zoom to magnify the subject 1.5 times regardless of zooming engaged by the power zoom T and W controls.

Press the INST. ZOOM button. "I. ZOOM" appears on the left side of the viewfinder or LCD ViewScreen and the picture is magnified 1.5 times.

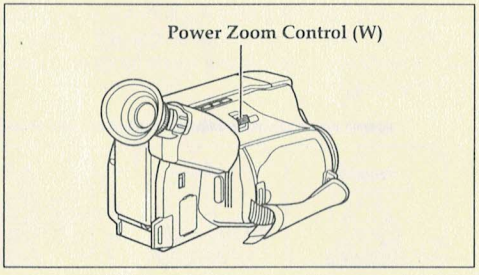
Note: To return to the original zoom position, press the INST. ZOOM button so that "I. ZOOM" disappears from the viewfinder or LCD ViewScreen.

Note: This instant zoom has certain limitations and may degrade the picture at extreme magnification and amplify camcorder's movement.



Using Macro

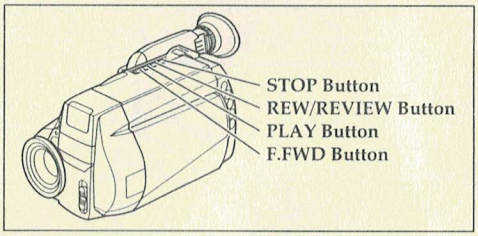
This function allows you to shoot subjects as close as 3/8 inches (1cm). Press and hold the power zoom control W. The camera focuses on the subject automatically. Check your lighting as it tends to be insufficient when filming close up.



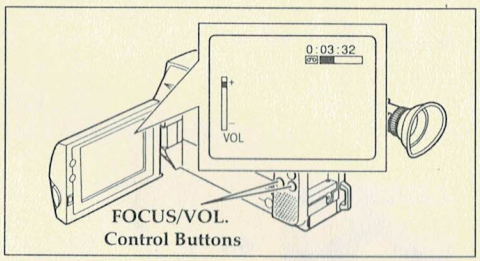
Playback

You can view recorded pictures on the LCD ViewScreen immediately after recording.

Note: Make sure the PAL60 switch is set to OFF when playing back tape. If it is set to PAL60, no color will appear in the playback picture.



1. Open the LCD ViewScreen, and then adjust the angle of the monitor ("Opening the LCD ViewScreen," p19).
2. Hold down the red button on the CAM/OFF/VIDEO switch while sliding the switch to VIDEO.
3. Press the REW/REVIEW button to rewind the tape. To fast forward the tape, press F.FWD.
4. Press the PLAY button and play back the tape. To adjust the volume, press the FOCUS/VOL control buttons. When either button is pressed, the volume adjustment display appears on the LCD ViewScreen for about 5 seconds. Press ▲ to increase the volume, or press ▼ to decrease it. After 5 seconds, the adjustment display automatically disappears.



5. Press the STOP button when you have finished.

Note: Decrease the sound volume of the camcorder when you play back a recording by connecting the camcorder to your TV. If the volume of the camcorder is set to maximum, the played back picture may be distorted. Make sure that the volume is not set to maximum during recording as it could distort the played back picture.

Note: When the LCD ViewScreen is turned on and left as it is, the monitor becomes warm, but this does not indicate a fault.

Note: When the CAM/OFF/VIDEO switch is set to CAM or VIDEO, the LCD ViewScreen is turned on and off automatically when the LCD ViewScreen is opened and closed.

Note: It is recommended that you close the LCD ViewScreen to save the battery power when playing back a picture on a TV without viewing it.

Note: Only the playback sound is heard. The sound being recorded is not heard.

Note: No sound is heard when the LCD ViewScreen is closed.

To play back a tape with the viewfinder

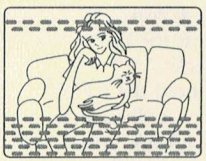
- Close the LCD ViewScreen, then press the PLAY button to play back the tape. The picture appears in the viewfinder.

Note: You cannot hear the playback sound when playing back your video with the viewfinder.

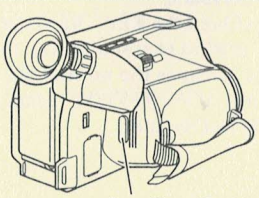
Using Still

To view a still picture during playback press the Start/Stop button. Press the Start/Stop button again to resume playback. If you leave the camcorder in play/pause mode for more than 5 minutes, the camcorder automatically stops to prevent damage to the tape. You can view a still picture with less noise on the LCD ViewScreen (Clear Still).

Note: The still picture will have several noise bars in the viewfinder and on the TV, but this does not indicate a fault.



Note: The still picture's quality will still contain noise bars if you freeze the picture with the LCD ViewScreen closed and then open the ViewScreen to look at the picture.



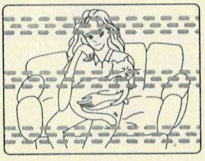
Using Forward and Reverse Search

When looking for a particular point in your videotape use the F.FWD button and REW/REVIEW button to find the spot quickly.

When the LCD ViewScreen is closed:

- Press the F.FWD button during playback to play the tape forward at approximately 9 times normal speed. Press the PLAY button to return to normal playback.
- Press and hold the F.FWD button during fast forward to visually scan the tape at 17 times the normal playback speed. Releasing F.FWD returns the camcorder to fast forward.
- Press the REW/REVIEW button during playback to play the tape backwards at approximately 7 times normal speed. Press the PLAY button to return to normal playback.
- Press and hold the REW/REVIEW button during fast rewind to visually scan the tape backwards at 15 times the normal playback speed. Releasing REW/REVIEW returns the camcorder to fast rewind.

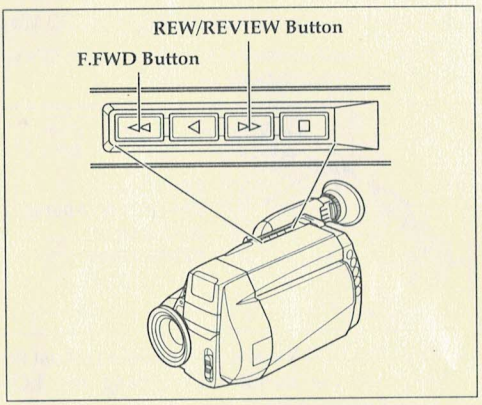
Note: When you press F.FWD button or REW/REVIEW button, the picture will have some interference or noise in the viewfinder. This is normal during search mode.



When the LCD ViewScreen is open (Clear Search):

You can view pictures with less noise on the LCD ViewScreen during forward or reverse search.

- Press the F.FWD button during playback to play the tape forward at 6 times normal play speed. Press the PLAY button to resume normal playback.
- Press and hold the F.FWD button during fast forward to visually scan the tape at 17 times the normal playback speed. Releasing F.FWD returns the camcorder to fast forward.
- Press the REW/REVIEW button during playback to play the tape in reverse at 4 times normal speed. Press the PLAY button to resume normal playback.
- Press and hold the REW/REVIEW button during fast rewind to visually scan the tape backwards at 15 times the normal playback speed. Releasing REW/REVIEW returns the camcorder to fast rewind.



Note: If you are using forward or reverse search with the LCD ViewScreen closed, you will not be able to view pictures with less noise when you open the ViewScreen.

Note: Several noise bars will appear on the TV screen during forward or reverse search.

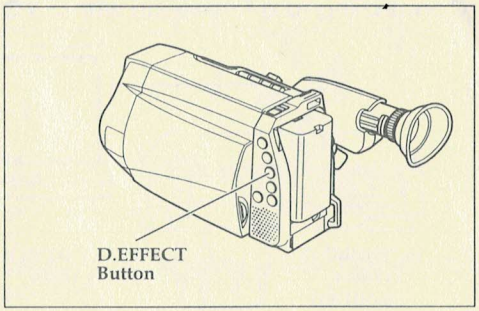
Note: A noiseless picture will not appear during high-speed search even if the LCD ViewScreen is open.

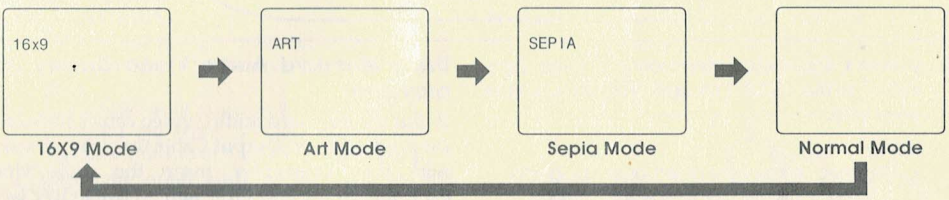
Note: Noise may flow during high-speed search in low temperature conditions.

Video Effects in Playback Mode

The digital signal processor (DSP) in this camcorder allows you to add special effects to playback pictures. Use this feature during tape dubbing, etc., to create a tape with a more artistic impression. The video effect modes during playback include: 16x9, Art, and Sepia.

- Each time the D.EFFECT button is pressed in the playback or play/pause mode, the playback mode switches as follows:



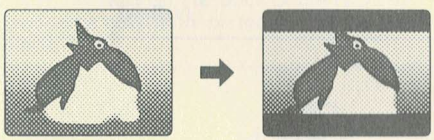


Activating Video Effects playback

1. Press the red button on the CAM/OFF/VIDEO switch as you slide it to VIDEO.
2. Play the tape or set the camcorder to the play pause mode.
3. Press the D.EFFECT button to select the video effect playback mode.

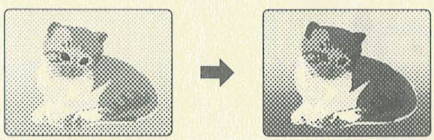
16x9

Black bars appear at the top and bottom of the picture.



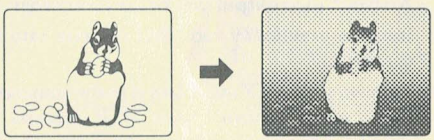
ART

The entire picture will take on the look of an oil painting.



SEPIA

The entire picture will be sepia.



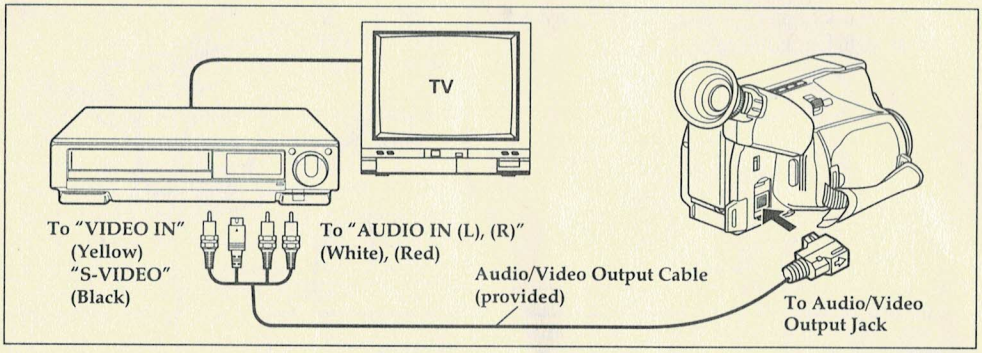
Note: To switch the mode or return to the normal picture during tape dubbing, temporarily stop dubbing and press the D.EFFECT button.

Note: When tape stops, the normal picture will be restored.

Playing Back Your Recording on Your TV

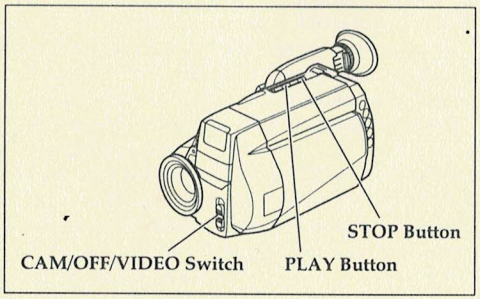
Depending on the setup of your video equipment, you connect the camcorder as explained in this section.

Connecting to a Television with a VCR Attached



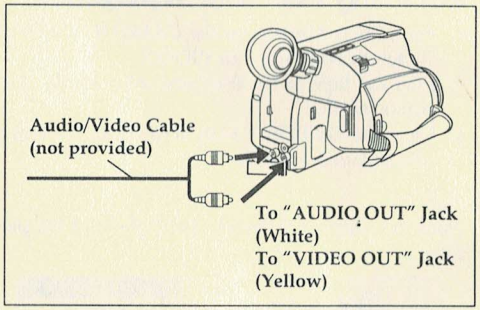
1. Connect the audio/video output cable (provided) to the AUDIO IN and VIDEO IN jacks of your VCR.

   Notes:
   - Connect either right or left audio plug into your VCR if it has only one AUDIO IN jack.
   - Some VCRs have an S-VIDEO IN jack. Connect the black S-VIDEO plug to the VCR instead of the yellow VIDEO plug.
2. Connect the other ends of the cable to the Audio/Video output jack of the camcorder.
3. Insert a previously recorded cassette into the camcorder.
4. Turn on your VCR and place it in the camcorder input mode (consult your VCR manual for details). Operate the television as you normally do to see the signal coming from the VCR.
5. Hold down the red button on the CAM/OFF/VIDEO switch while sliding the switch to VIDEO.
6. Press the PLAY button to begin playback.
7. Press the STOP button when finished.

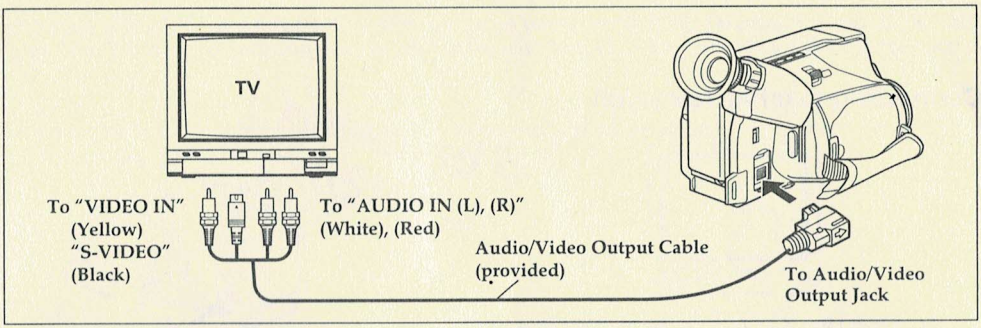


Using Standard Audio/Video Cables (not provided)

If you use standard audio/video cables instead of the Audio/Video Output Cable that was provided with your camcorder, insert the audio/video cables to the VIDEO OUT and AUDIO OUT jacks underneath the cover.



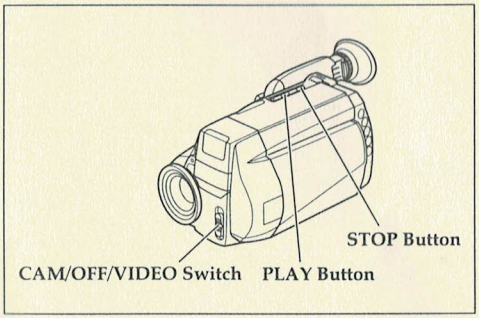
Connecting to a Television with Audio In and Video In Jacks



1. Connect the audio/video output cable (provided) to the AUDIO IN and VIDEO IN jacks of your television.

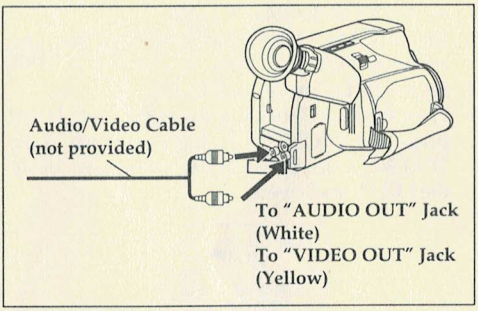
   Notes:
   - Connect either right or left audio plug into your television if it has only one AUDIO IN jack.
   - Some televisions have an S-VIDEO IN jack. Connect the black S-VIDEO plug to the television instead of the yellow VIDEO plug.
2. Connect the other ends of the cable to the Audio/Video output jack of the camcorder.
3. Insert a previously recorded cassette into the camcorder.
4. Turn on your television and set to the camcorder input mode (consult your television manual for details).
5. Hold down the red button on the CAM/OFF/VIDEO switch while sliding the switch to VIDEO.
6. Press the PLAY button to begin playback.
7. Press the STOP button when finished.

   Note: Some televisions have their AUDIO/VIDEO IN jacks on the back of the television and some have them on the front of the television.



Using Standard Audio/Video Cables (not provided)

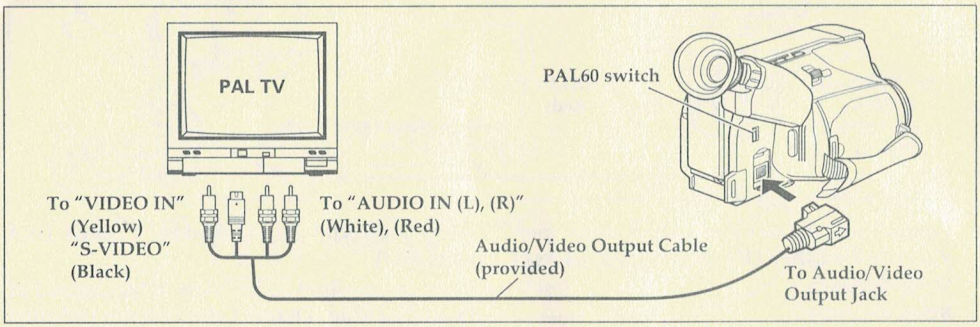
If you use standard audio/video cables instead of the Audio/Video Output Cable that was provided with your camcorder, insert the audio/video cables to the VIDEO OUT and AUDIO OUT jacks underneath the cover.



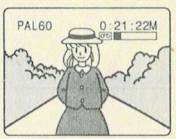
Multi Playback

This camcorder can convert an NTSC recorded tape into "PAL60" format signal. "PAL60" is a special output signal format with which a PAL TV can be used to view a tape recorded on an NTSC recorder.

Connecting to a PAL Television



1. Connect the camcorder to TV as shown in the figure.
2. Turn the TV on and select the TV "video input". Set the TV to the PAL60 mode.
3. Set the CAM/OFF/VIDEO switch of the camcorder to VIDEO.
4. Set the PAL60 switch to PAL60.
5. Press the PLAY button of the camcorder. If you press the DATE/DISP. button at this time, "PAL60" will appear in the viewfinder or on the LCD ViewScreen.



6. When playback is finished, reset the PAL60 switch to OFF.
7. Set the CAM/OFF/VIDEO switch to OFF to turn off the camcorder.

Note: Connect the camcorder to a TV monitor which has a vertical sync adjustment circuitry (volume) for 60 Hz and which can also be locked into the PAL60 mode. Refer to the TV instruction manual for details on how to set the TV.

Note: This camcorder cannot record using the PAL60 system.

Note: A black-and-white picture will appear on the LDC monitor when playing back tape with the PAL60 system.

Note: The PAL60 switch is effective during playback only.

Note: Depending on the state of the tape recorded, the PAL60 switch may not operate normally.

Note: After using the PAL60 switch, turn the camcorder off once before using it again. Failure to do so may result in abnormal appearance of color.

Advanced Techniques

Your camcorder has a diverse group of features that add interest and excitement to your video. Adding fades to smooth transitions creates video with a professional look.

As you learn and practice with these features, think of situations where they might fit and add that special touch.

Changing the Angle of the LCD ViewScreen when Recording

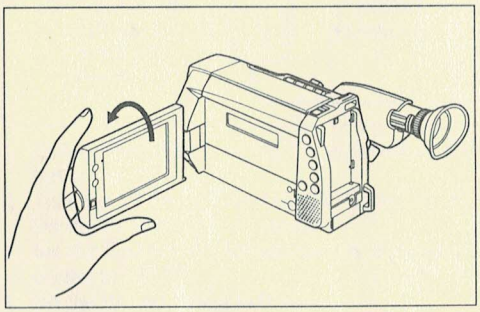
You can change the angle of the LCD ViewScreen so that the picture on the LCD ViewScreen can be monitored from different positions.

See "LCD ViewScreen" (p19) for the range in which you can change the angle of the LCD ViewScreen.

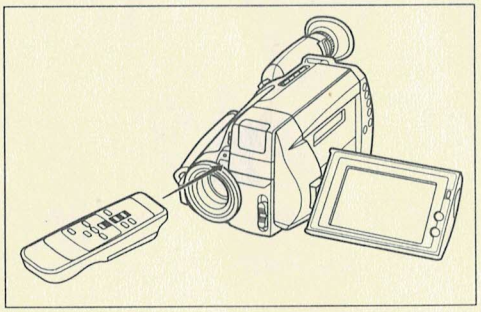
Note: You need the remote control to operate the camcorder.

Recording an Image of Yourself while Monitoring the LCD ViewScreen

1. Open the LCD ViewScreen ("Opening the LCD ViewScreen," p19).
2. Turn the LCD ViewScreen so the monitor screen faces the same direction as the lens.



Press the START/STOP button on the remote control, and the camcorder will begin recording.

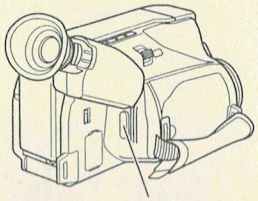


Note: When you record an image of yourself, the image displayed on the LCD ViewScreen will become a mirror image. The on-screen display on the LCD ViewScreen will also be as if reflected on a mirror.

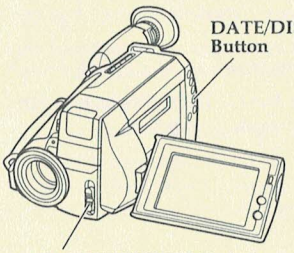
Note: Tilt the LCD ViewScreen in the direction of the camera lens so that it faces up slightly, and the screen may be viewed easily.

Date Recording

When the date has been set, the camcorder will enter the automatic date recording mode automatically.



Start/Stop Button

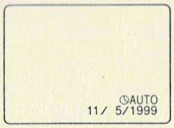


CAM/OFF/VIDEO Switch

1. Press the red button on the CAM/OFF/ VIDEO switch as you slide it to CAM.
2. Press the DATE/DISP. button to specify the date display you want to record.

" ◷ AUTO" and Date — Automatic Date Recording

This option records the date automatically once a day at the beginning of recording for 10 seconds.



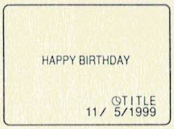
Note: The camcorder records the same date when:

— the cassette is replaced.
— you select " ◷ AUTO" and date display again.
— the recording is less than 10 seconds long.

Note: If the date changes while recording continues more than 10 seconds, the new date is recorded for about 10 seconds the next time you make a recording.

" ◷ TITLE" and Date —Automatic Title and Date Recording

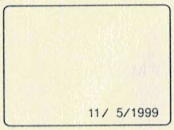
This option records the date and selected title or created title (see "Creating and Recording a Title," p45) automatically once a day at the beginning of recording for 10 seconds.



Note: When " ◷ TITLE" is displayed in the viewfinder or on the LCD ViewScreen, the title cannot be turned on or off using the remote control.

Date —Date Recording

The camcorder records the date with the picture all the time.

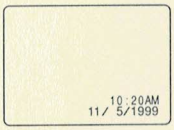


No Display—No Date Recording

The camcorder does not record the date.

Date and Time—Date and Time Recording

The camcorder records the date and time with the picture all the time.



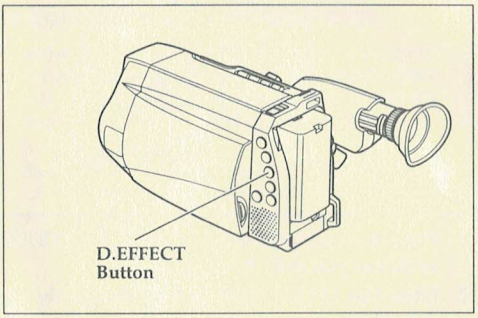
3. Press the Start/Stop button.
   Recording starts.
   Note: When " ◷ AUTO" and date display is selected, the date disappears about 10 seconds after recoding is started.
   Note: When " ◷ TITLE" and date display is selected, the title and date disappear about 10 seconds after recoding is started.

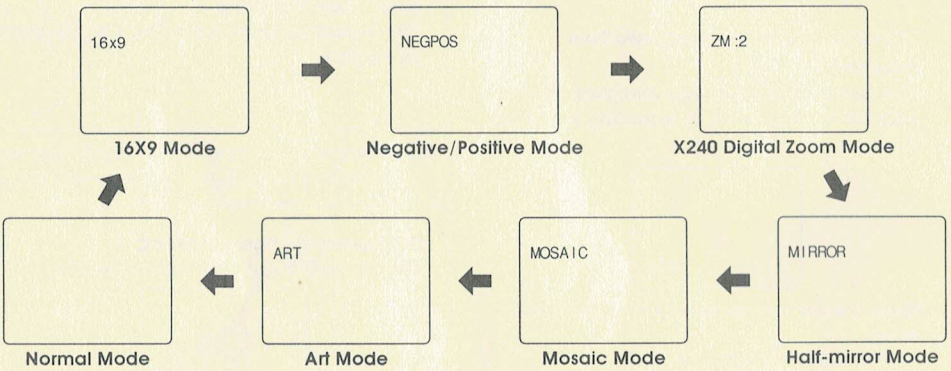
Digital Effects Recording

The digital processor in this camcorder allows you add special effects to your recording: 16x9 recording mode, a negative image (negative/positive mode), 240 times digital zoom feature (with instant zoom), a symmetric image (obtained by placing a mirror at the center of the screen [half-mirror mode]), an image in mosaic (mosaic mode), and an oil painting look (art mode).

Note: The half-mirror recording and mosaic recording functions cannot be used with digital zoom, instant zoom, or image stabilizer function.

- Each time the D.EFFECT button is pressed, the recording mode is switched.



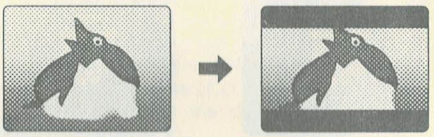


Activating Digital Effects Recording

1. Place the camcorder in the record pause mode.
2. Press the D.EFFECT button to select the digital effects record mode you want.

16x9: 16x9 Mode

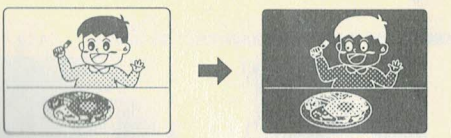
The picture format can be switched from 4:3 (the picture format of an ordinary TV set) to 16x9. Black bars appear at the top and bottom of the picture in the viewfinder or on the LCD ViewScreen.



Normal Mode 16X9 Mode

NEGPOS: Negative/Positive Mode

The image in the viewfinder or on the LCD ViewScreen becomes negative.



Normal Mode Negative/Positive Mode

ZM:2: x240 Digital Zoom Mode

Slide and hold the power zoom control to the "T" side until you reach your desired magnification.

Normal Mode x240 Digital Zoom Mode

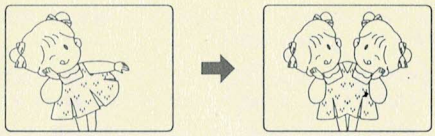
- This function can magnify an image up to 240 times when instant zoom is used at the same time.

MIRROR: Half-mirror Mode

The image in the viewfinder or on the LCD ViewScreen changes to a symmetric image on the left and right, obtained by placing a mirror at the center of the screen.

Note: This function cannot be used with digital zoom, instant zoom or image stabilizer function.

Note: The subject image will be compressed in the horizontal direction and narrow slightly.



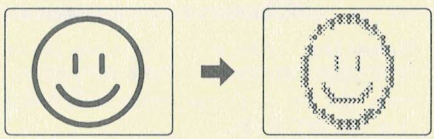
Normal Mode Half-mirror Mode

MOSAIC: Mosaic Mode

The image in the viewfinder or on the LCD ViewScreen appears as mosaic.

Note: This function cannot be used with digital zoom, instant zoom or image stabilizer function.

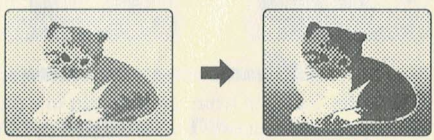
Note: The subject image will be compressed in the horizontal direction and narrow slightly.



Normal Mode Mosaic Mode

ART: Art Mode

The image in the viewfinder or on the LCD ViewScreen takes on the look of an oil painting.



Normal Mode Art Mode

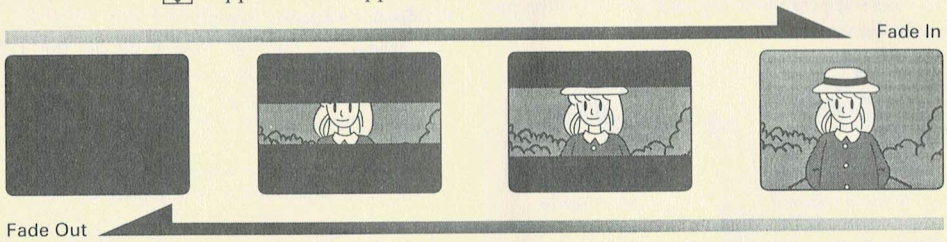
3. Press the Start/Stop button to start recording.
   - To stop digital effects recording, repeatedly press the D.EFFECT button in the record pause mode until the normal mode is restored.

Using Digital Fade

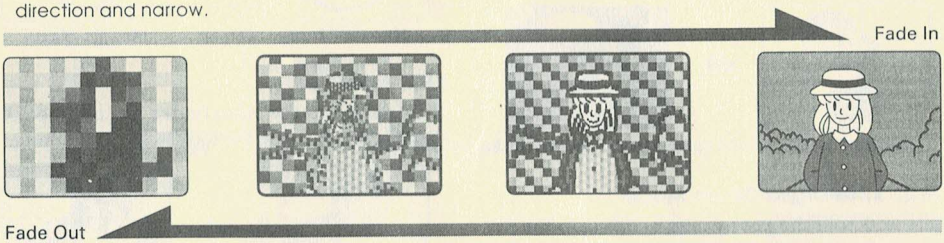
Use the fade feature to add a professional touch to your recordings. Use the FADE button to select one of the four fade options.

Note: If you press the D.EFFECT button after setting the fade function, the fade function will be stopped. After setting the digital effect mode, reset the fade function.

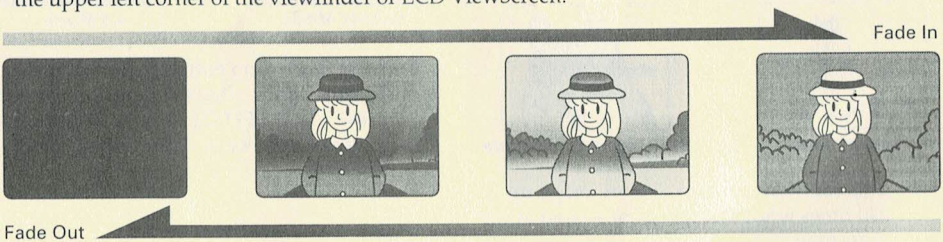
- **Wipe fade:** The picture opens gradually from the center of a black screen or closes into the center to a black screen. " [↕] " appears in the upper left corner of the viewfinder or LCD ViewScreen.



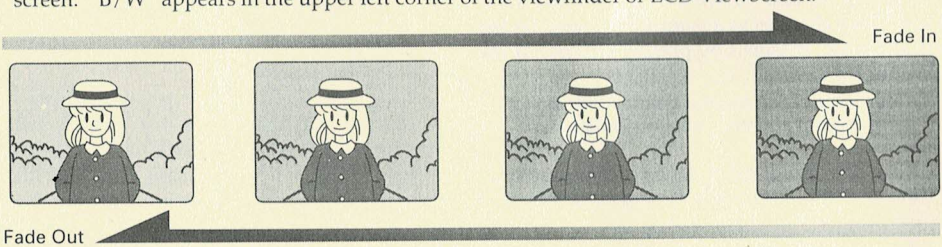
- **Mosaic fade:** Fades in from a picture in mosaic or fades out to a picture in mosaic. "MOS.F" appears in the upper left corner of the viewfinder or LCD ViewScreen.
  Note: The subject image, immediately before fading in or out, will be compressed in the horizontal direction and narrow.



- **Art fade:** Fades in from, or fades out to a picture with the feel of an oil painting. "ART.F" appears in the upper left corner of the viewfinder or LCD ViewScreen.



- **Black-and-white fade:** Fades in from a black-and-white screen or fades out to a black-and-white screen. "B/W" appears in the upper left corner of the viewfinder or LCD ViewScreen.



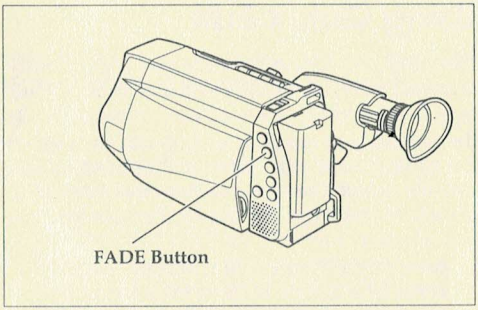
Fading In

1. Press the FADE button to select a fade option before recording.
2. Press the Start/Stop button to start recording; fade begins automatically.

Fading Out

1. While recording with the camcorder, press the FADE button to select a fade option.
2. Press the Start/Stop button to stop recording; the fade begins automatically and "REC" flashes until the fade ends.

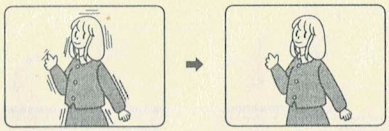
   Note: When fading out be sure to wait until the pause indicator (●II) is visible in the viewfinder or on the LCD ViewScreen before attempting to put the camcorder into the record mode again.



Using the Electronic Image Stabilizer

The electronic image stabilizer (EIS) corrects slight shaking of the image being recorded and is effective in the following situations.

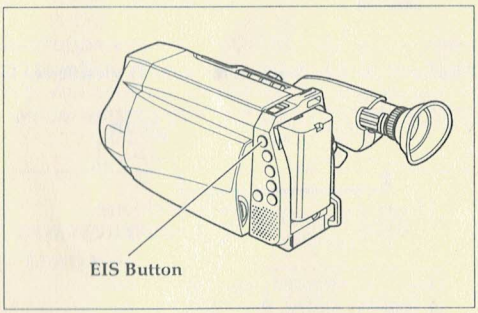
- While you zoom to a distant subject.
- While you approach a small subject.
- While you walk around.
- While you record from inside a moving vehicle.



1. Press the EIS button. The EIS icon ( ) appears in the upper left corner of the viewfinder or LCD ViewScreen.
2. Press the Start/Stop button to start recording. When EIS is on, the viewfinder or LCD ViewScreen image shakes with a slight delay.

   Note: EIS may not function if you use a wide or tele converter lens.

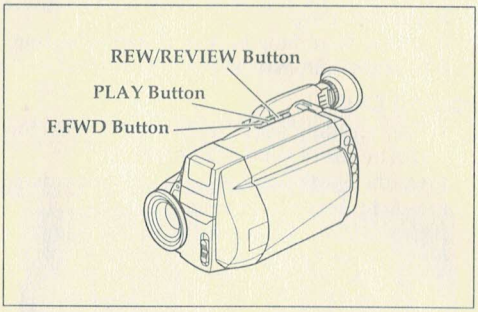
   Note: It is recommended that you do not use the EIS function when using a tripod. The sensor detects vibrations from the tripod which blurs the picture.



Using Quick Edit

Use quick edit to search for the end of previously recorded material, find a particular spot on your tape, begin editing, or record new material. While the camera is in record/pause mode, hold down the F.FWD, REW/REVIEW, or PLAY button and visually search the tape. Release the button and the camcorder stops the tape at the exact position you selected.

Note: If the F.FWD or REW/REVIEW button is pressed for quick edit, noise will appear in the viewfinder, on the LCD ViewScreen, or on the connected TV.

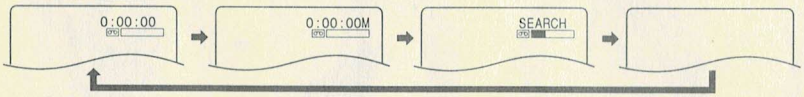


Using the Display Button

Pressing the DISPLAY button on the remote control enables you to switch the displays to the viewfinder or to the LCD ViewScreen.

Display in the viewfinder or on the LCD ViewScreen in the VIDEO mode:

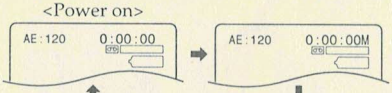
<Power on>



Linear time counter → Linear time counter with memory → Date search function → No display

Display in the viewfinder or on the LCD ViewScreen in the CAM mode:

<Power on>



Linear time counter → Linear time counter with memory

- When a recorded tape is in the camcorder during the VIDEO mode, "SEARCH" appears in the viewfinder or on the LCD ViewScreen. (See "Date Search" on page 43.)

Note: The linear time counter with the memory feature and "SEARCH" in the viewfinder or on the LCD ViewScreen can also be displayed on the connected television.

Note: If the LCD ViewScreen is opened or closed (the picture is switched) during playback, the on-screen display in the picture will disappear for about one second, and then reappear again.

Note: When the date and time appear on the LCD ViewScreen, you cannot erase them by pressing the DISPLAY button. If you want to erase the on-screen display, press the DATE/DISP. button on the camcorder.

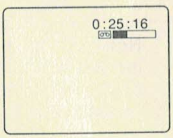
Date Search

The date search function memorizes the start and end positions of recordings you made on a specific day so you can easily locate those positions later as long as the cassette is left in the camcorder.

Note: Be sure that the date and time are set.

1. Attach a power source and slide the CAM/OFF/VIDEO switch to VIDEO.
2. Press the DATE/DISP. button or the DISPLAY button on the remote control to display "SEARCH" in the viewfinder or on the LCD ViewScreen.

3. Press the REW/REVIEW button to search for the start position of your recording or the F.FWD button to search for the end position. "◀◀ SEARCH" will appear while the start position is being searched for; "SEARCH ▶▶" appears while the end position is being searched for.
4. When the required position is located, the camcorder enters the stop mode and "SEARCH" disappears from the viewfinder or LCD ViewScreen.



Note: If you have ejected the cassette, this function will not operate with that cassette. (When a cassette is inserted and the recording is started, the position is identified as the recording start position on that day.)

Note: If the clock battery is not inserted, the date search function does not operate when the battery providing the power to the camcorder is removed.

Note: When the cassette was recorded by another camcorder, the date search function does not operate.

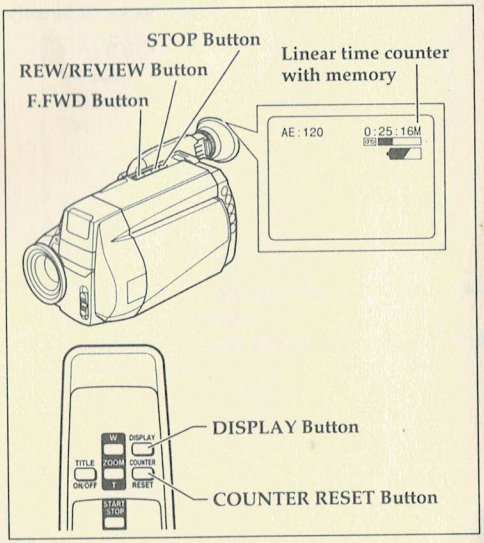
Note: The date search function is released when you press the STOP button during date search mode.

Note: If the recorded time is less than 30 seconds, the date search function may not operate normally.

Using Memory

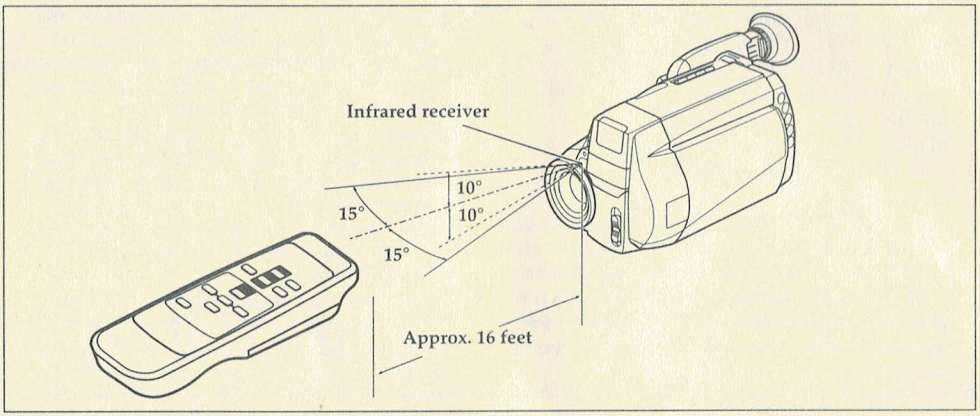
The linear time counter memory stops a rewinding tape at approximately "0:00:00M." This feature helps in locating a specific point in the tape to which you wish to return. An example might be that you have recorded some tape that you have already watched, you continue recording but do not care to watch the tape you recorded earlier. The memory feature returns you to the beginning of the most recent recording.

1. Start recording or playback of a cassette. Press the COUNTER RESET button on the remote control at the point to which you wish to return. The linear time counter clears to "0:00:00."
2. Press the STOP button to stop playback, or press the Start/Stop button recording and set the CAM/OFF/VIDEO switch to VIDEO.
3. Press the DISPLAY button on the remote control or the DATE/DISP. button on the camcorder so the linear time counter with memory is displayed as shown in the figure.
4. Press the REW/REVIEW button and the tape stops at the approximate place where you reset the linear time counter. This feature works in F.FWD as well.



Using the Remote Control

Use the remote control to operate the camcorder from a distance. The PLAY, F.FWD, REW, STOP, PAUSE (START/STOP) and ZOOM buttons on the remote control operate the functions of the corresponding buttons on the camcorder. Aim the remote control at the infrared receiver of the camcorder.



Note: Use the remote control within the range of the infrared receiver of the camcorder shown above.

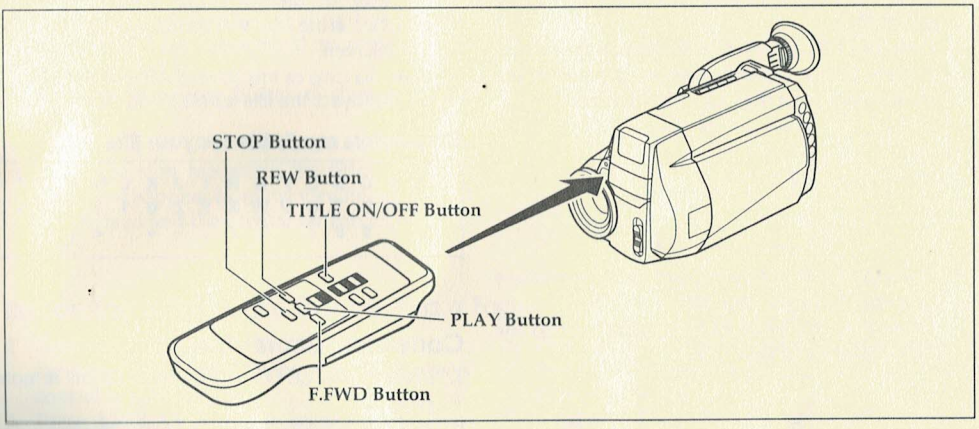
Note: The remote control may not function in strong light such as direct sunlight or very bright artificial lighting.

Note: Clear a direct path from the remote control to the infrared receiver. The remote control won't work if an obstacle blocks the infrared rays.

Creating and Recording a Title

The titling function enables you to select one of nine titles stored in the camcorder's memory, or create a new title, and record it. Select or create a title and personalize your recordings, while at the same time keeping a permanent visual record of what is contained on a tape.

When creating and recording a title, use the TITLE ON/OFF button on the remote control. (When creating a title in the CAM mode, the DATE/DISP. button of the camcorder can be used instead of the TITLE ON /OFF button on the remote control. "◷ TITLE" should appear in the viewfinder or on the LCD ViewScreen at this time).



Selecting Stored Title

Note: Be sure to insert the clock battery before selecting a title. Although a title can be chosen without the clock battery inserted, it will disappear when the battery providing power to the camcorder is removed.

1. Connect the camcorder to a power source.
2. Hold down the red button on the CAM/OFF/VIDEO switch and slide it to either CAM or VIDEO.
3. Press the TITLE ON/OFF button on the remote control.
   A flashing cursor appears in the viewfinder or on the LCD ViewScreen, and the camcorder enters the title creating mode ("Creating a Title" on next page).

4. Press the PLAY button.
   "HAPPY BIRTHDAY" appears.

5. Use the F.FWD or REW button to select a desired title.

Stored titles available

HAPPY BIRTHDAY
MERRY CHRISTMAS
CONGRATULATIONS
THE SUPERSTAR
VACATION FUN
THANKSGIVING
HAPPY EASTER
ANNIVERSARY
HAPPY NEW YEAR

6. After you have selected the title, press the TITLE ON/OFF button.
   The selected title will be stored in memory and then disappear.

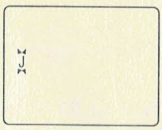
Creating a Title

A title contains two lines of up to 16 characters per line. The camcorder contains 47 different characters for creating a title.

Note: Be sure to insert the clock battery before creating a title. Although a title can be created without the clock battery inserted, it will disappear when the battery providing power to the camcorder is removed.

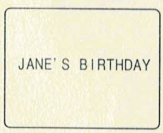
1. Connect the camcorder to a power source.
2. Hold down the red button on the CAM/OFF/VIDEO switch and slide it to either CAM or VIDEO.
3. Press the TITLE ON/OFF button on the remote control and a flashing cursor appears in the viewfinder or on the LCD ViewScreen.

4. Press the STOP button to place the cursor where you wish to begin your title.
5. Press the F.FWD and REW buttons to select the first character of your title.



6. Once you've selected a character, press the STOP button to set it.

7. Complete the title by repeating steps 5 and 6.



8. When you complete your title, press the TITLE ON/OFF button on the remote control to store the title in memory and remove the title graphics from the viewfinder or on the LCD ViewScreen.

   Note: As long as the correct current time can be displayed, the title is held in memory.

Characters available for your title

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Q	R	S	T	U	V	W	X	Y	Z	0	1	2	3	4	5
6	7	8	9	?	'	.	/	,	-	+	:	<	>	!	

Correcting Errors

1. Press the TITLE ON/OFF button on the remote control.
2. Press the STOP button to move to the character you want to correct.
3. Press the F.FWD and REW buttons to correct the character.
4. Press the TITLE ON/OFF button on the remote control to store the corrected title in memory.

Recording Title on a Tape in the Camcorder

1. Hold down the red button on the CAM/OFF/VIDEO switch while sliding the switch to CAM.
2. Locate the point on the tape where you want to record the title ("Using Quick Edit," p42).
3. Press the TITLE ON/OFF button on the remote control.
4. Press the PLAY button to select the title (the title you have created or the existing title in camcorder you have memorized on page 45) you wish to record.
5. Press the Start/Stop button to start recording the title.
6. Press the TITLE ON/OFF button on the remote control to stop recording the title. The title graphics disappear from the viewfinder or LCD ViewScreen and the camcorder can record normally.

Note: Create and store your title before an event you plan to record. Just press the TITLE ON/OFF button on the remote control to superimpose the title over the scene as you record it. This method avoids erasing previously recorded material which will happen when you record a title on a previously recorded tape.

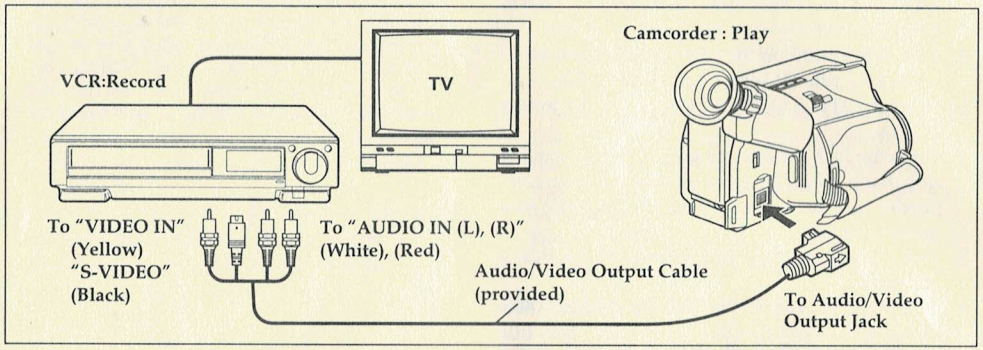
Recording a Title while Transferring a Tape

1. Connect the camcorder to the VCR (p32).
2. Press the TITLE ON/OFF button on the remote control to turn title on.
3. Press the PLAY button to select the title from memory.
4. Press the TITLE ON/OFF button to turn title off.
5. Turn on the VCR and set it to record. Hold down the red button on the CAM/OFF/VIDEO switch while sliding the switch to VIDEO. Press PLAY on the camcorder.
6. Press the TITLE ON/OFF button on the remote control at the point on the tape where you wish to record the title.
7. Press the TITLE ON/OFF button on the remote control again to stop recording the title.

Note: Recording the title during tape transfer will erase a portion of your recorded material.

Dubbing from the Camcorder to a VCR

Connect the camcorder to a VCR to copy an 8mm recording to a VHS tape.



1. Connect your camcorder to the VCR, following "Playing Back Your Recording on Your TV" on page 32.
2. Turn on your VCR and place it in the camcorder input mode (consult your VCR manual for details). Operate the television as you normally do to see the signal coming from the VCR.
3. Hold down the red button of the CAM/OFF/VIDEO switch while you slide the switch to VIDEO.
4. Insert the recorded tape in the camcorder and a blank tape into the VCR. Set the VCR to record.
5. Play the tape from the camcorder while recording on the VCR.

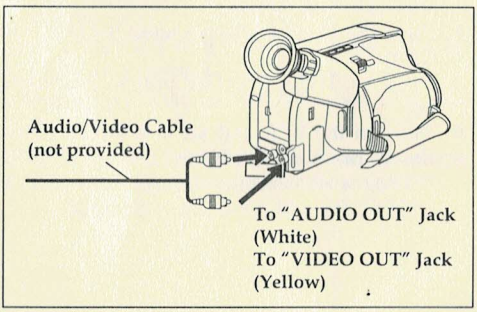
Note: If the VCR is connected to a television and the VCR/TV selector is set to VCR, you can watch the tape being dubbed.

Note: Reduce the volume of the camcorder as low as possible during dubbing. Otherwise the played back pictures could be distorted.

Note: During multi playback (PAL60 output), dubbing may not be possible with some VCRs.

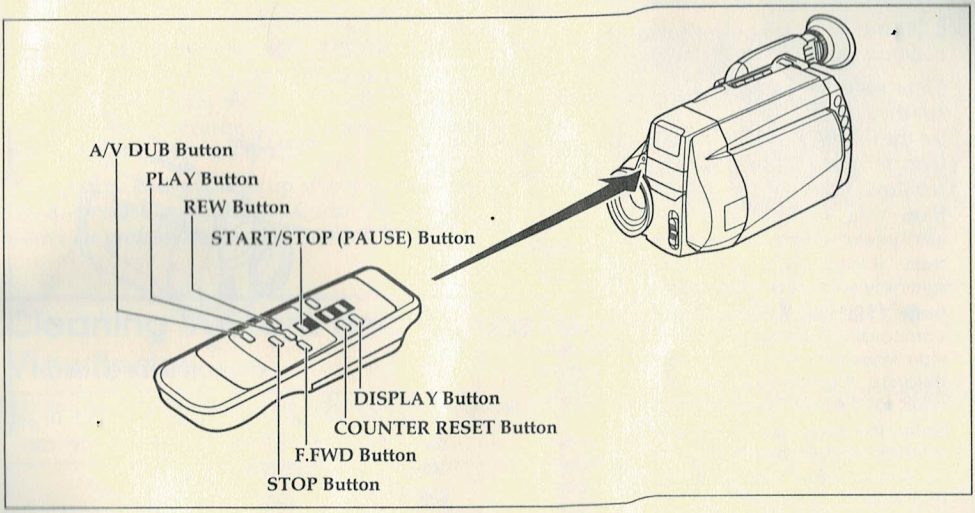
Using Standard Audio/Video Cables (not provided)

If you use standard audio/video cables instead of the Audio/Video Output Cable that was provided with your camcorder, insert the audio/video cables to the VIDEO OUT and AUDIO OUT jacks underneath the cover.



Using Audio/Video Dubbing

Use audio/video dubbing to record audio and video from the camcorder's built-in microphone and camera onto a previously recorded tape in the camcorder.



1. Hold down the red button on the CAM/OFF/VIDEO switch while sliding the switch to VIDEO.
2. Insert a previously recorded tape in the camcorder.
3. Use the remote control and press the PLAY button. Use the PLAY, F.FWD, and REW buttons to find the place where you want to stop dubbing. Press the START/STOP (PAUSE) button.
4. Display the linear time counter with memory ("Using Memory," p43). Press the COUNTER RESET button to set the linear time counter to "0:00:00M."
5. Use the REW and PLAY buttons to find where you wish to start dubbing. Press the START/STOP (PAUSE) button.
6. Place the CAM/OFF/VIDEO switch to CAM position. The record pause indicator ●II appears and the camcorder is ready to record.
7. Press and hold the A/V DUB button, then press PLAY. This places the camcorder A/V DUB pause mode. ●II disappears replaced by A/V DUB II.
8. Press the start/stop button on the camcorder or START/STOP (PAUSE) on the remote control. The audio/video dubbing starts. When the linear time counter reaches "0:00:00M" the camcorder stops automatically, recording only the portion of the tape that you selected.

Note: If the camcorder is in AV DUB pause or STILL mode for more than 5 minutes, the camcorder stops automatically to protect the tape.

Note: When the audio/video dubbed portion is played back, noise may appear at the end of the dubbed portion.

Using the Auto DC Light

Use the auto light if you wish to shoot objects in dark places.

When you set the LIGHT switch to "AUTO," the light turns on automatically when the camcorder is pointed at objects in a dark place and turns off when it is pointed at objects in a bright place.

CAUTION: Since the power consumption of the auto light is high, the camcorder operating time will decrease even with a fully charged battery.

1. Make sure that a fully charged battery pack is attached.
2. Set the CAM/OFF/VIDEO switch to CAM and then set the LIGHT switch to AUTO when required.

   Note: When the LIGHT switch is set to ON, the light turns on whenever you make a recording.

   Note: If the LIGHT switch is set to AUTO, the light may not turn on immediately.

   Note: If the LIGHT switch is set to AUTO and the camcorder is pointed at a white subject with high reflectivity in a dark place from a short distance, the light may turn on or off. In this case, set the LIGHT switch to ON.

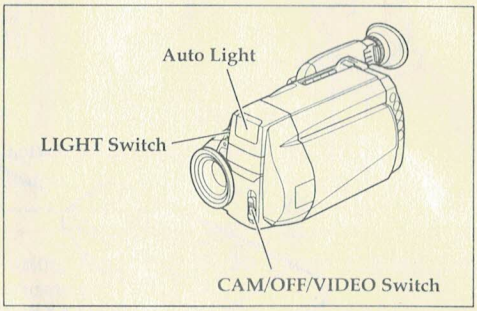
   Note: The auto light will turn off when a cassette is inserted or ejected, or during quick edit or review, even if you have manually turned on the light.

   Note: The auto light will not turn on when the CAM/OFF/VIDEO switch is set to VIDEO.

   CAUTIONS:

   - Turn the auto light on only when you need it, otherwise the operating time of the battery pack is shortened due to the power consumption of the auto light.
   - When the LIGHT switch is set to AUTO, the auto light does not turn on unless a cassette is loaded.

   CAUTION: Do not hold the unit by the auto light when carrying it, as this could cause a malfunction.



3. After use, set the LIGHT switch to OFF or set the CAM/OFF/VIDEO switch of the camcorder to OFF position.

   CAUTIONS:

   - During operation and/or after using the auto light, the front surface and lamp of the light will be very hot. To avoid burns or hair damage, don't touch the front surface or the lamp.
   - When the auto light is on, do not allow water to drop on the light.
   - When the auto light is on, avoid subjecting the light to impacts or sharp vibrations.
   - Do not allow the cooling vents to become blocked. Also, do not cover the auto light with paper or other objects, since the air flow will be interrupted, resulting in possible overheating hazard.
   - Never use the auto light in the vicinity of explosive or highly inflammable materials.
   - After using the auto light, cool the light section sufficiently before storing the camcorder in the case.
   - The lamp can only be replaced by a service engineer. If the lamp has blown, consult your nearest service center.

Demonstration Mode

Your camcorder is equipped with a demonstration mode. The demonstration starts if the camcorder is powered for more than 10 minutes without a cassette in it when the date isn't set or the date/title battery is dead.

There are two ways to cancel the demonstration once it starts:

- disconnect the power to the camcorder and reconnect power
- insert a cassette

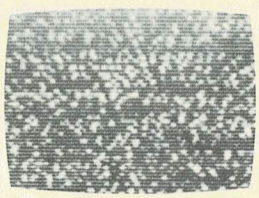
To prevent the demonstration from starting, set the date and make sure the date/title battery has power.

General Maintenance

Cleaning the Camcorder Heads

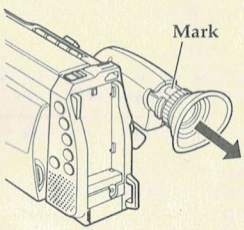
Dirt can accumulate on the video heads on the camcorder causing the playback picture to become blurred or appear as if video information is lost. This often means that the video heads are dirty. Use a video head cleaner such as a dry type head cleaning tape to clean the heads.

If the picture does not clear up after you clean the heads, consult Circuit City or a Circuit City Service Center for professional head cleaning.

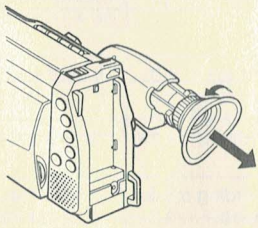


Cleaning the Lens and Picture Tube of the Electronic Viewfinder

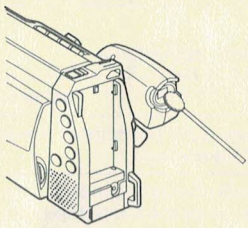
The lens of the electronic viewfinder can be user-cleaned if dust, dirt, or other foreign matter adheres to it.



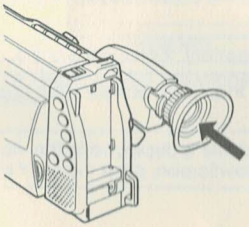
1. Pull out the eye cup to the position where you can see the mark (half way to pulling it out all of the way). The side with the mark should be up.



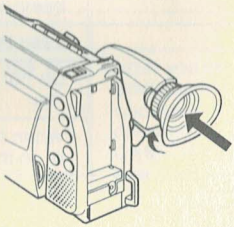
2. Turn the eye cup counterclockwise until it stops, then pull it out to remove.



3. Clean the picture tube face and lens. To prevent scratching, use a soft non-abrasive cloth, swab or lens cleaning paper.



4. Face the rib up as shown above and push the eye cup in until it stops.



5. Turn the eye cup clockwise until it stops, then push it in all the way.

riodic Maintenance

A precision electromechanical device, your camcorder requires maintenance after a period of normal use. We expect that no maintenance other than head cleaning will be required during the period of warranty unless the camcorder is used either heavily or seldom. Defective parts are covered by the warranty. Normal maintenance is the responsibility of the owner. Consult Circuit City or a Circuit City Service Center for recommendations regarding normal maintenance based on your use patterns, location, and the age of the camcorder.

Troubleshooting

Quality is very important to Circuit City. If you have a problem with your camcorder, please check the following solutions before inquiring about professional service.

INSERTING OR REMOVING THE CASSETTE

Problem	Solution
You can't open the cassette holder.	• Connect the power source.
You can't insert the cassette into cassette compartment.	• Load cassette in direction indicated by arrow on cassette.
	• Cassette window must be toward outside.

CAMERA RECORDING

Problem	Solution
Picture does not appear in the viewfinder or on the LCD ViewScreen.	• Slide the CAM/OFF/VIDEO switch to CAM.
The camcorder cannot go into the recording mode, even when the Start/Stop button is pressed.	• Check the record-protect tab on the cassette. See page 18 for details.
	• Slide the CAM/OFF/VIDEO switch to CAM.
Picture is out of focus. Auto-focus does not operate.	• Make sure that "FOCUS" does not appear in the viewfinder or on the LCD ViewScreen. If it is displayed, press FOCUS/VOL. Control buttons to erase it.
	• Auto-Focus does not operate if a special-effects filter is attached or the objects shown on page 26 are being recorded.
The created title does not appear.	• Insert the clock battery, then create a title.
	• Do not remove the clock battery after creating a title.
	• When the stored title is displayed in the viewfinder or on the LCD ViewScreen, press the PLAY button.

PLAYBACK OF PRE-RECORDED CASSETTE

Problem	Solution
The PLAY button doesn't work.	• Set the CAM/OFF/VIDEO switch to VIDEO.
Picture bends at the top of TV screen.	• TV receiver is too old, it needs to be modified to work properly with camcorder.
	• Tape is damaged. Try another cassette.
Color of your TV screen is too bright or too faint.	• TV set has VIR circuit. Turn it off during playback.
Date search function does not operate.	• Slide the CAM/OFF/VIDEO switch to VIDEO.
	• Insert the clock battery, set the date and time, then start recording.
	• Do not remove the clock battery after recording.
	• Do not eject the recorded cassette. Leave it in the camcorder.

BATTERY CONDITION

Problem	Solution
The (▰) indicator in the electronic viewfinder or on the LCD ViewScreen flashes to indicate battery is discharged.	• Try another battery or charge the battery.
The battery level indicator (▭) appears differently on the LCD ViewScreen and in the viewfinder.	• This does not indicate a fault; it is because the power consumed by the LCD ViewScreen and viewfinder is different.

NO OPERATION IS ACCEPTED

Problem	Solution
The LCD ViewScreen is black and white. The color of the LCD ViewScreen is not normal. Power is not turned on. Power is turned on, but none of the buttons work.	• Remove the power source and the clock battery. And after about one minute, the display in the viewfinder or on the LCD ViewScreen will be reset. Then set the information again.

TAPE DISPLAY

Problem	Solution
"TAPE" appears in the viewfinder or on the LCD ViewScreen.	• Have you moved the camcorder or cassette from a cold place to a warm place so that its temperature changed abruptly? If the temperature has changed, remove the cassette and set the CAM/OFF/VIDEO switch to OFF, then wait for about one hour.
	• Remove the cassette and then try to reinsert: remove it several times. If the indication is still shown in the viewfinder or on the LCD ViewScreen, use a cleaning tape to clean the heads and replace the cassette.

Specifications

General Specifications

Power requirements	7.2V DC
Power consumption	PRO898LH: 3.7W (when recording/LCD ViewScreen OFF) 4.6W (when recording/LCD ViewScreen ON) PRO998LH: 3.7W (when recording/LCD ViewScreen OFF) 4.9W (when recording/LCD ViewScreen ON)
Dimensions	4-11/16" W x 4-1/16" H x 7-1/8" D (118.5 mm x 102.5 mm x 181 mm)
Weight	PRO898LH: 1.89 lbs (approx. 860g) without battery pack and cassette PRO998LH: 1.92 lbs (approx. 870g) without battery pack and cassette
Operating temperature	32°F ~ 104°F (0°C ~ 40°C)
Storage temperature	–4°F ~ 140°F (–20°C ~ 60°C)

Video Recorder Specifications

Format	8 mm
Record/playback	Two video record/playback heads
Video signal	EIA standard NTSC color
Tape speed	14.3 mm/sec
Video output	1.0 Vp-p, 75 ohm
Audio output	–7.8 dBs (316mVrms)
Fast forward/rewind time	Less than 8 minutes with P6-120 cassette

Camera Specifications

Scanning	525 lines/60 fields/30 frames
Required minimum illumination	0.5 lux
Pickup device	1/4" C.C.D.
Lens	F1.4 - 2.8 (4 ~ 64 mm) 16:1 power zoom lens with auto focus and auto iris functions
Lens diameter	46 mm

LIMITED WARRANTY

1. **What your warranty covers:**
   - Any defect in materials or workmanship.

   For how long after your purchase:
   - 90 days for labor charges.
   - One year for parts.

2. **What we will do:**

   During the initial 90 days
   - Repair your camcorder at no cost to you.

   After the 90 days and within one year
   - Repair your camcorder and parts will be provided at no charge, but you will be responsible for the cost of labor required for the repair.

3. **How you get service:**
   - If your camcorder requires service, you must take the unit and a copy of your receipt to the nearest Circuit City Store or a Circuit City service center. For the location nearest you, call Circuit City Answer City at 1-800-950-9000.
   - For information regarding operation or service needs regarding your camcorder, contact Circuit City Answer City at:
     1-800-950-9000 Hours: Monday–Saturday 10 a.m.–10 p.m.
     Sunday 12 p.m.–9 p.m.
   - This PROSCAN model has been manufactured exclusively for and to the specifications of Circuit City Stores, Inc. For any repair service, under warranty or not, you must take the product to a Circuit City location only.

4. **What your warranty does not cover:**
   - Adjustment of customer controls.
   - Damage from misuse or neglect.
   - A unit that has been modified or incorporated into other products or is used for institutional or other commercial purposes.
   - Batteries.
   - Cleaning of video/audio heads.
   - Camcorders purchased or serviced outside the USA.
   - Return transportation, storage, and handling costs of your unit, including insurance for loss or damage.
   - Acts of God, such as but not limited to lightning damage.

5. **How State Law relates to warranty:**
   - This warranty gives you specific legal rights, and you may have other rights that vary from state to state.

6. **If you purchased your camcorder outside the USA:**
   - This warranty does not apply. Contact your dealer for warranty information.

Circuit City Stores, Inc.
9950 Mayland Drive
Richmond, Virginia 23233

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